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Nos. 80-1640, 80-1656

In the Supreme Court of the United States

OCTOBER TERM, 1980

UNITED STATES NUCLEAR REGULATORY COMMISSION AND THE UNITED STATES OF AMERICA,
Petitioners

v.

STEVEN SHOLLY, ET AL.

METROPOLITAN EDISON COMPANY, ET AL.,
Petitioners

v.

PEOPLE AGAINST NUCLEAR ENERGY, ET AL.

ON WRITS OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

JOINT APPENDIX

PETITIONS FOR WRITS OF CERTIORARI FILED MARCH 30, 1981
AND APRIL 2, 1981
CERTIORARI GRANTED MAY 26, 1981

In the Supreme Court of the United States

OCTOBER TERM, 1980

No. 80-1640

UNITED STATES NUCLEAR REGULATORY COMMISSION AND THE UNITED STATES OF AMERICA,
Petitioners

v.

STEVEN SHOLLY, ET AL.

No. 80-1656

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Petitioners

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ON WRITS OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

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(The opinion (Pet. App. 1a-27a) and judgment (*id.* at 47a-48a) of the court of appeals, the statement dissenting from the denial of rehearing en banc (*id.* at 29a-46a), the June 12, 1980 "Memorandum and Order" of the Nuclear Regulatory Commission (*id.* at 49a-61a) and the Commission's June 12, 1980, "Order for Temporary Modification of License" (*id.* at 62a-67a) are printed as appendices to the petition for a writ of certiorari in No. 80-1640)

COURT OF APPEALS DOCKET ENTRIES

D.C. Cir. No. 80-1691

STEVEN SHOLLY, DONALD E. HOSSLER, PETITIONERS

v.

UNITED STATES NUCLEAR REGULATORY COMMISSION, ET AL., and the UNITED STATES OF AMERICA, RESPONDENTS

METROPOLITAN EDISON COMPANY, ET AL., INTERVENORS

DATE	FILINGS—PROCEEDINGS
06-23-80	Petitioners' petition for review of an order of the NRC
06-24-80	Certified copy of petition for review was mailed to the NRC & Attorney General
6-24-80	Petitioners' motion for injunctive, declaratory and other relief
6-24-80	Petitioners' motion requesting expeditious consideration of petition for review of final NRC orders
6-24-80	Petitioners' motion for argument and hearing on motions
6-25-80	Motion of Metropolitan Edison Company, et al. for leave to intervene
6-26-80	Respondent's (USA) response to petitioners' motion for injunction pending appeal
6-26-80	Respondent's (NRC) opposition to petitioners' motion for injunction pending appeal (Volumes I and II of a blue book attached)
6-26-80	Certified Index to Record
6-26-80	Clerk's order granting the motion of Metropolitan Edison Company, et al. for leave to intervene

DATE	FILINGS—PROCEEDINGS

6-27-80 Intervenor's opposition to motion for an injunction pendente lite and other relief

6-27-80 Per Curiam order denying the motion for oral argument and denying the motion for injunctive, declaratory and other relief, and granting motion for expeditious consideration. The certified index to record and briefs of the parties shall be filed under a schedule to be developed by the parties provided only that the final brief is filed no later than August 29, 1980; CJ Wright, Tamm (who did not participate) and MacKinnon, CJs

6-27-80 Petitioners' petition for rehearing and suggestion for rehearing en banc

6-27-80 Petitioners' motion requesting expeditious consideration of petition for rehearing

6-27-80 Per Curiam order denying petitioners' petition for rehearing; CJ Wright and MacKinnon, CJ

6-27-80 Per Curiam order, en banc, denying petitioners' suggestion for rehearing en banc; CJ Wright; McGowan, Tamm, Robinson, MacKinnon, Robb, Wilkey, Wald, Mikva and Edwards, CJs

6-28-80 Petitioners' motion to amend petition and motion for 5 day injunction pendente lite to allow oral argument on petitioners' motion for an order of mandamus directing the holding of public nuclear regulatory hearing, etc.

6-28-80 Petitioners' formal demand for an adjudicatory hearing prior to venting gases from Three Mile Island Unit 2

6-28-80 Petitioners' motion for 5 day TRO stopping the effectuation of the NRC's two 6/12/80 orders until 7/3/80 at 5:00 PM

6-28-80 Per Curiam order denying petitioners' motion to amend petition, etc; petitioners' formal demand, etc; and petitioners' motion for 5 days TRO, etc.; CJ Wright; MacKinnon and Wilkey, CJs

DATE	FILINGS—PROCEEDINGS

7-2-80 Intervenor's notice of filing of executed affidavit of Michael P. Morrell

07-16-80 Intervenor's motion to consolidate Nos. 80-1691, 80-1783 & 80-1784

7-17-80 NRC's motion to consolidate Nos. 80-1691, 80-1783 & 80-1784 and opposition to request for emergency relief

7-23-80 Clerk's order consolidating Nos. 80-1691, 80-1783 and 80-1784

7-31-80 Clerk's order that the following briefing schedule is approved:

Petitioners main brief—8/1/80; Respondents' brief—20 days after petitioners' brief; Intervenors' brief—5 days after respondents' brief; Reply brief—8/29/80

07-31-80 Petitioners' brief

07-31-80 Appendix

07-31-80 Exhibit

08-08-80 Intervenors' motion to dismiss petitions and to suspend briefing and oral argument schedule

08-15-80 Petitioners' opposition to intervenors' motion to dismiss and suspend briefing and oral argument schedule

08-18-80 NRC's response to motion to dismiss

08-19-80 Clerk's order granting intervenors' motion to suspend briefing and oral argument and all briefing and oral argument are held in abeyance pending consideration by the Court on the pending motion to dismiss

08-20-80 Intervenors' reply to petitioners' opposition to motion to dismiss

08-20-80 Respondent's (NRC) brief

08-21-80 Clerk's order, sua sponte, that the order of 8/18/80 is vacated; the briefing will proceed on the previous schedule and oral argument will be heard on 9/8/80; Oral argument on intervenors' motion to dismiss will also be heard on 9/8/80

DATE	FILINGS—PROCEEDINGS

08-22-80 Respondent's (US) motion for leave to file brief in typewritten form, pending printing

08-25-80 Clerk's order granting respondent's (US) motion to file brief in typewritten form

08-25-80 Respondent's (US) brief in typewritten form

08-25-80 Clerk's order, sua sponte, that the following times are allotted for the oral argument of these cases: Petitioners—30 minutes; Respondents—30 minutes (Vacated 9-5-80)

08-26-80 Intervenors' brief

08-26-80 Intervenors' appendix

08-27-80 Respondent's (NRC) brief

08-27-80 Respondent's Draft Programmatic Environmental Impact Statement—Lodged for convenience of Court

08-29-80 NRC's motion for leave to file reply brief

08-29-80 Petitioners' reply brief to respondents' brief

08-29-80 Petitioners' reply brief on mootness

09-02-80 NRC's motion to re-allocate time allotted for oral argument

09-03-80 Petitioners' opposition to NRC's motion dated August 29, 1980 and September 2, 1980

09-04-80 Clerk's order granting respondent's motion for leave to file reply brief

09-04-80 Respondent's reply brief

09-05-80 Clerk's order that this Court's order of August 25, 1980 is vacated and that the following times are allotted for the oral argument: Petitioners—30 minutes; NRC—20 minutes; USA—20 minutes

09-08-80 Argued before CJ Wright, Mikva and Edwards, CJ's

DATE	FILINGS—PROCEEDINGS

09-10-80 Respondent's (USA) brief (memorandum)

11-19-80 Opinion Per Curiam

11-19-80 Judgment by the Court, that the Court declares that NRC acted unlawfully in refusing to hold a hearing in connection with requested Venting Order, all in accordance with the opinion of this Court filed herein this date

12-01-80 Petitioners' motion for award of attorneys' fees

12-03-80 Petitioners' bill of costs

12-05-80 Intervenors' (Metropolitan Edison, et al.) motion for leave to file petition for rehearing and suggestion for rehearing en banc with attached affidavit

12-09-80 Respondents' opposition to motion for award of attorneys' fees

12-10-80 NRC's motion for leave to file response to petition for rehearing and suggestion for rehearing en banc filed by Metropolitan Edison, et al.

12-10-80 NRC's motion for leave to file petition for rehearing out of time

12-10-80 NRC's motion for leave to file motion for issuance of stay of mandate

12-11-80 Petitioner's motion to award costs as penalty for frivolous petition for rehearing

12-19-80 Intervenor's (Public Utilities) opposition to petitioners' motion to award costs

01-06-81 Per Curiam order that the Clerk is directed to file the petition for rehearing of the NRC; and that the Clerk is directed to file the petition for rehearing and suggestion for rehearing, en banc, of the Public Utilities; and that the Clerk is directed to file the NRC's response to Public Utilities petition for rehearing and suggestion for rehearing, en banc; CJ Wright, Mikva and Edwards, CJ's

DATE	FILINGS –PROCEEDINGS

01-06-81 NRC's petition for rehearing—filed per above order

01-06-81 Intervenor's (Public Utilities) petition for rehearing and suggestion for rehearing, en banc—filed per order of 1-6-81

01-06-81 NRC's response to intervenor's (Public Utilities) petition for rehearing and suggestion for rehearing, en banc—filed per order of 1-6-81

01-06-81 Per Curiam order that the Clerk is directed to file the motion of the NRC for stay of mandate; and that the Clerk is directed to stay the issuance of this Court's mandate through February 10, 1981; CJ Wright, Mikva and Edwards, CJ's

01-06-81 NRC's motion to stay issuance of mandate—filed per above order

01-06-81 Petitioner's opposition to NRC's motion to stay issuance of mandate

02-03-81 NRC's motion to extend stay of mandate

02-12-81 Per Curiam order granting NRC's motion to stay mandate and Clerk is directed to stay issuance of mandate for a period of 30 days after disposition of the pending petition for rehearing and suggestion for rehearing en banc; Wright, Mikva & Edwards, CJs

03-03-81 Per curiam order by this Court amending the opinion for the Court filed on 11/19/80 as follows: (see order for details).

03-04-81 ORDERED by the Court, en banc, that the suggestion for rehearing en banc of the Public Utilities is hereby denied.

03-04-81 Circuit Judge Tamm, MacKinnon, Robb and Wilkey would grant rehearing en banc. Their statement is attached (Opinion form).

03-04-81 Per Curiam order on consideration of the petitions for rehearing of the NRC and Public Utilities; the aforesaid petitions are denied.

DATE	FILINGS—PROCEEDINGS

03-12-81 Intervenors' motion to stay issuance of mandate pending applications for certiorari

03-18-81 NRC's motion for further extension of stay of mandate

03-23-81 Per Curiam order that petitioners' motion for an award of attorney's fees is denied; and that petitioners' motion to award costs as a penalty is denied; Wright, Mikva and Edwards, CJ's

04-03-81 Notice from Clerk, SC that petition for writ of certiorari was filed on 3/30/81 in SC No. 80-1640

04-06-81 Certified copy of notice from Clerk, Supreme Court that a petition for writ of certiorari was filed on March 30, 1981 in SC No. 80-1640 and is now pending

04-09-81 Per Curiam order that the motions to stay the issuance of mandate (filed by intervenors Metropolitan Edison Co., et al. and respondent) are granted and the Clerk is directed not to issue the mandate herein prior to May 5, 1981; CJ Wright, Mikva and Edwards, CJ's

04-09-81 Notice from Clerk, Supreme Court that a petition for writ of certiorari was filed in SC No. 80-1656 on April 2, 1981

04-29-81 ORDERED, by the Court that the opinion filed on 11/19/80 is hereby amended as follows: (see order for details).

04-29-81 ORDERED, BY THE Court that the Statement on Denial of Rehearing En banc filed 3/4/81 is amended as follows: (see order for details).

06-03-81 Certified copy of order from Clerk, Supreme Court granting petition for writ of certiorari in SC No. 80-1640 on 05/26/81

06-03-81 Certified copy of order from Clerk, Supreme Court granting petition for writ of certiorari in SC No. 80-1656 on 05/26/81

COURT OF APPEALS DOCKET ENTRIES

D.C. Cir. No. 80-1783

(Transferred from the Third Circuit)

PEOPLE AGAINST NUCLEAR ENERGY, PETITIONER

v.

UNITED STATES NUCLEAR REGULATORY COMMISSION; JOHN AHEARNE; VICTOR GILINSKY; RICHARD T. KENNEDY; JOSEPH M. HENDRIE; and PETER A. BRADFORD, in their individual capacities; and the UNITED STATES, RESPONDENTS

METROPOLITAN EDISON COMPANY, JERSEY CENTRAL POWER & LIGHT COMPANY, and PENNSYLVANIA ELECTRIC COMPANY, INTERVENORS

DATE	FILINGS—PROCEEDINGS
07-11-80	Original proceedings transferred from USCA for the Third Circuit (with 2 black binders)
07-11-80	Petitioner's motion for temporary stay or suspension of the operation of two 6/12/80 NRC orders pending the hearing on petitioner's application for stay pending review, and for early hearing thereafter (filed in 3rd circuit)
07-11-80	Petitioner's motion for stay (filed in 3rd Circuit)
07-11-80	Petitioner's motion for an order setting aside the NRC's two 6/12/80 findings (filed in 3rd Circuit)
07-11-80	Petitioner's motion for an order setting aside the NRC's 6/12/80 order making final its 6/12/80 order (filed in 3rd circuit)
07-11-80	Petitioner's motion for entry of declaratory judgment (filed in 3rd Circuit)

DATE	FILINGS—PROCEEDINGS

07-11-80 Petitioner's motion for an order granting request for expedited briefing, oral argument, etc. (filed in 3rd Circuit)

07-11-80 Petitioner's motion for an order directing that briefs be submitted within 3 days and that hearing be held in 5 days (filed in 3rd Circuit)

07-16-80 Intervenor's motion to consolidate Nos. 80-1691, 80-1783 & 80-1784

07-17-80 NRC's motion to consolidate Nos. 80-1691, 80-1783 & 80-1784 and opposition to request for emergency relief

07-17-80 Intervenor's opposition to petitioner's requests for emergency relief

07-23-80 Clerk's order consolidating Nos. 80-1691, 80-1783 and 80-1784

07-31-80 Clerk's order that the following brief schedule is approved: Petitioner's main brief—on or before 8/1/80; Respondents' brief—20 days after petitioners' brief; Intervenors' brief—5 days after respondents' brief; petitioners' reply brief—8/29/80

07-31-80 15-Petitioners' brief

07-31-80 7-appendix

07-31-80 4-Exhibits

08-08-80 4-Intervenors' motion to dismiss petitions and to suspend briefing and oral argument schedule

08-15-80 4-Petitioners' opposition to intervenors' motion to dismiss and to suspend briefing and oral argument schedule

08-18-80 4-NRC's response to motion to dismiss

08-19-80 Clerk's order granting intervenors' motion to suspend briefing and oral argument and all briefing and oral argument are held in abeyance pending consideration by the Court on the pending motion to dismiss (vacated 8/21/80 order)

DATE	FILINGS—PROCEEDINGS

08-20-80 Intervenor's reply to petitioners' opposition to motion to dismiss

08-20-80 Respondent's (NRC) brief

08-21-80 Clerk's order, sua sponte, that the order of 8/19/80 is vacated; The briefing will proceed on the previous schedule and oral argument will be heard on 9/8/80; Oral argument on intervenors' motion to dismiss will also be heard on 9/8/80

08-22-80 Respondent's (US) motion for leave to file typewritten brief, pending printing

08-25-80 Clerk's order granting respondent's (US) motion to file brief in typewritten form

08-25-80 7-Respondent's (US) brief in typewritten form

08-25-80 Clerk's order, sua sponte, that the following times are allotted for the oral argument of these cases: Petitions—30 minutes; Respondents—30 minutes. (Vacated per 9-5-80 order)

08-26-80 Intervenors' brief

08-26-80 Intervenors' appendix

08-27-80 Respondent's (NRC) brief

08-27-80 Respondent's Draft Programmatic Environmental Impact Statement—Lodged for convenience of Court

08-29-80 NRC's motion for leave to file reply brief

08-29-80 Petitioners' reply brief to respondents' brief

08-29-80 Petitioners' reply brief on mootness

09-02-80 NRC's motion to re-allocate time allotted for oral argument

09-03-80 Petitioners' opposition to NRC's motions dated August 29, 1980 and September 2, 1980

DATE	FILINGS—PROCEEDINGS

09-04-80 Clerk's order granting respondent's motion for leave to file reply brief

09-04-80 Respondent's reply brief

09-05-80 Clerk's order that this Court's order of August 25, 1980 is vacated and that the following times are allotted for oral argument: Petitioners—30 minutes; NRC—20 minutes; USA—20 minutes

09-08-80 Argued before CJ Wright, Mikva and Edwards, CJ's

09-10-80 15-Respondent's (USA) brief (memorandum)

11-19-80 Opinion Per Curiam

11-19-80 Judgment by the Court, that the Court declares that NRC acted unlawfully in refusing to hold a hearing in connection with requested Venting Order, all in accordance with the opinion of this Court filed herein this date

12-01-80 Petitioners' motion for award of attorneys' fees

12-03-80 Petitioners' bill of costs

12-05-80 Intervenors' (Metropolitan Edison, et al.) motion for leave to file petition for rehearing and suggestion for rehearing en banc with attached affidavit

12-09-80 Respondents' opposition to motion for award of attorneys' fees

12-10-80 NRC's motion for leave to file response to petition for rehearing and suggestion for rehearing en banc filed by Metropolitan Edison, et al.

12-10-80 NRC's motion for leave to file petition for rehearing out of time

12-10-80 NRC's motion for leave to file motion for issuance of stay of mandate

12-11-80 Petitioner's motion to award costs as penalty for frivolous petition for rehearing

DATE	FILINGS—PROCEEDINGS

12-19-80 Intervenor (Public Utilities) opposition to petitioners' motion to award costs

01-06-81 Per Curiam order that the Clerk is directed to file the petition for rehearing of the NRC; and that the Clerk is directed to file the petition for rehearing and the suggestion for rehearing, en banc, of the Public Utilities; and that the Clerk is directed to file the NRC's response to Public Utilities petition for rehearing and suggestion for rehearing, en banc: CJ Wright, Mikva and Edwards, CJ's

01-06-81 NRC's petition for rehearing filed per order of 01-06-81

01-06-81 Intervenor's (Public Utilities) petition for rehearing and suggestion for rehearing, en banc—filed per order of 1-6-81

01-06-81 NRC's response to intervenor's (Public Utilities) petition for rehearing and suggestion for rehearing, en banc, filed per order of 1-6-81

01-06-81 Per Curiam order that the Clerk is directed to file the motion of the NRC for stay of mandate; and that the Clerk is directed to stay the issuance of this Court's mandate through February 10, 1981; CJ Wright, Mikva and Edwards, CJ's

01-06-81 NRC's motion to stay issuance of mandate—filed per above order

01-06-81 Petitioners' opposition to NRC's motion to stay issuance of mandate

02-03-81 NRC's motion to extend stay of mandate

02-12-81 Per Curiam order granting NRC's motion to stay mandate and Clerk is directed to stay issuance of mandate for a period of 30 days after disposition of the pending petition for rehearing and suggestion for rehearing en banc; Wright, Mikva & Edwards, CJs

DATE	FILINGS—PROCEEDINGS

03-03-81 Per Curiam order by this Court amending the opinion for the Court filed on 11/19/80 as follows: (see order for details).

03-04-81 ORDERED by the Court, en banc, that the suggestion for rehearing en banc of the Public Utilities is hereby denied.

03-04-81 Circuit Judge Tamm, MacKinnon, Robb and Wilkey would grant rehearing en banc. Their statement is attached (Opinion).

03-04-81 Per Curiam order on consideration of the petitions for rehearing of the NRC and Public Utilities, the aforesaid petitions are denied.

03-12-81 Intervenors' motion to stay issuance of mandate pending application for writ of certiorari

03-18-81 NRC's motion for further extension of stay of mandate

03-23-81 Per Curiam order that petitioners' motion for an award of attorney's fees is denied; and that petitioners' motion to award costs as a penalty is denied; Wright, Mikva and Edwards, CJ's

04-03-81 Notification from Clerk, SC that petition for writ of certiorari was filed on 03/30/81 in SC No. 80-1640

04-06-81 Certified copy of notice from Clerk, Supreme Court that a petition for writ of certiorari was filed in SC No. 80-1640 on March 30, 1981 and is now pending

04-09-81 Per Curiam order that the motions to stay the issuance of the mandate (filed by intervenors Metropolitan Edison Co., et al. and respondent) are granted and the Clerk is directed not to issue the mandate herein prior to May 5, 1981; CJ Wright, Mikva and Edwards, CJ's

04-09-81 Notice from Clerk, Supreme Court that a petition for writ of certiorari was filed in SC No. 80-1656 on April 2, 1981

DATE	FILINGS—PROCEEDINGS

04-29-81 ORDERED, by the Court that the Opinion filed on 11/19/80 is hereby amended as follows: (see order for details).

04-29-81 ORDERED, by the Court that the Statement on Denial of Rehearing En Banc filed 3/4/81 is amended as follows: (see order for details).

06-03-81 Certified copy of order from Clerk, Supreme Court granting petition for writ of certiorari in SC No. 80-1640 on 05/26/81

06-03-81 Certified copy of order from Clerk, Supreme Court granting petition for writ of certiorari in SC No. 80-1656 on 05/26/81

COURT OF APPEALS DOCKET ENTRIES

D.C. Cir. No. 80-1784

(Transferred from the Third Circuit)

IN RE: PEOPLE AGAINST NUCLEAR ENERGY, PETITIONER

DATE	FILINGS—PROCEEDINGS
07-11-80	Petitioner's petition for writ of mandamus—transferred from the United States Court of Appeals for the Third Circuit
07-17-80	NRC's motion to consolidate Nos. 80-1691, 80-1783, 80-1784 and opposition to request for emergency relief
07-23-80	Clerk's order consolidating Nos. 80-1691, 80-1783 and 80-1784
07-31-80	Clerk's order that the following briefing schedule is approved: Petitioners' main brief—on or before 8/1/80; Respondents' brief—20 days after petitioners' brief; Intervenors, brief—5 days after respondents' brief; petitioners reply brief—8/29/80
07-31-80	Petitioners' brief
07-31-80	Appendix
07-31-80	Exhibit
08-19-80	Clerk's order granting intervenors' motion to suspend briefing and oral arguments and all briefing and oral argument are held in abeyance pending consideration by the Court on the pending motion to dismiss (vacated 8/21/80 order)
08-20-80	4-Respondent's (NRC) brief
08-21-80	Clerk's order, sua sponte, that the order of 8/19/80 is vacated; The briefing will proceed on the previous schedule and oral argument will be heard on 9/8/80; Oral argument on intervenors' motion to dismiss will also be heard on 9/8/80

DATE	FILINGS—PROCEEDINGS

08-22-80 4-Respondent's (US) motion for leave to file typewriten brief, pending printing

08-25-80 Clerk's order granting respondent's (US) motion to file brief in typewritten form

08-25-80 Respondent's (US) brief in typewritten form

08-25-80 Clerk's order, sua sponte, that the following times are allotted for the oral argument of these cases; Petitioners—30 minutes; Respondents—30 minutes (Vacates per 9-5-80 order)

08-27-80 Respondent's (NRC) brief

08-27-80 Respondent's Draft Programmatic Environmental Impact Statement—Lodged for convenience of Court

08-29-80 NRC's motion for leave to file reply brief

08-29-80 Petitioners' reply brief to respondents' brief

08-29-80 Petitioners' reply brief on mootness

09-02-80 NRC's motion to re-allocate time for oral argument

09-03-80 Petitioners' opposition to NRC's motions filed August 29, 1980 and September 2, 1980

09-04-80 Clerk's order granting respondent's motion for leave to file reply brief

09-04-80 Respondent's reply brief

09-05-80 Clerk's order that this Court's order of August 25, 1980 is vacated and that the following times are allotted for oral argument: Petitioners—30 minutes; NRC—20 minutes; USA—20 minutes

09-08-80 Argued before CJ Wright, Mikva and Edwards, CJ's

09-10-80 15-Respondent's (USA) brief (memorandum)

11-19-80 Opinion Per Curiam

DATE	FILINGS—PROCEEDINGS

11-19-80 Judgment by this Court, that the Court declares that NRC acted unlawfully in refusing to hold a hearing in connection with requested Venting Order, all in accordance with the opinion of this Court filed herein this date

12-01-80 Petitioners' motion for award of attorneys' fees

12-03-80 Petitioners' bill of costs

12-05-80 Intervenors' (Metropolitan Edison, et al.) motion for leave to file petition for rehearing and suggestion for rehearing en banc with attached affidavit

12-09-80 Respondents' opposition to motion for award of attorneys' fees

12-10-80 NRC's motion for leave to file response to petition for rehearing and suggestion for rehearing en banc filed by Metropolitan Edison, et al.

12-10-80 NRC's motion for leave to file petition for rehearing out of time

12-10-80 NRC's motion for leave to file motion for issuance of stay of mandate

12-11-80 Petitioners' motion for award of costs as penalty for frivolous petition for rehearing

12-19-80 4-Intervenor's (Public Utilities) opposition to petitioners' motion to award costs

01-06-81 Per Curiam order that the Clerk is directed to file the petition for rehearing of the NRC; and that the Clerk is directed to file the petition for rehearing and suggestion for rehearing, en banc, of the Public Utilities; and that the Clerk is directed to file the NRC's response to Public Utilities petition for rehearing and suggestion for rehearing, en banc; CJ Wright, Mikva and Edwards, CJ's

01-06-81 NRC's petition for rehearing filed per above order

DATE	FILINGS—PROCEEDINGS

01-06-81 Intervenor's (Public Utilities) petition for rehearing and suggestion for rehearing, en banc—filed per order of 1-6-81

01-06-81 4-NRC's response to intervenor's (Public Utilities) petition for rehearing and suggestion for rehearing, en banc—filed per order of 1-6-81

01-06-81 Per Curiam order that the Clerk is directed to file motion of the NRC for stay of mandate; and that the Clerk is directed to stay the issuance of this Court mandate through February 10, 1981; CJ Wright, Mikva and Edwards, CJ's

01-06-81 NRC's motion to stay issuance of mandate—filed per above order

01-06-81 Petitioners' opposition to NRC's motion to stay issuance of mandate

02-03-81 NRC's motion to extend stay of mandate

02-12-81 Per Curiam order granting NRC's motion to stay mandate and Clerk is directed to stay issuance of mandate for a period of 30 days after disposition of the pending petition for rehearing and suggestion for rehearing en banc; Wright, Mikva & Edwards, CJs

3-3-81 Per curiam order by this Court amending the opinion for the Court filed on 11/19/80 as follows: (see order for details).

3-4-81 ORDERED by the Court, en banc, that the suggestion for rehearing en banc of the Public Utilities is hereby denied

3-4-81 Circuit Judges Tamm, MacKinnon, Robb and Wilkey would grant rehearing en banc. Their Statement is attached (Opinion).

3-4-81 Per Curiam order on consideration of the petitions for rehearing of the NRC and Public Utilities, the aforesaid petitions are denied.

DATE	FILINGS—PROCEEDINGS

03-12-81 Intervenors' motion to stay issuance of mandate pending application for certiorari

03-18-81 NRC's motion for further extension of stay of mandate

03-23-81 Per Curiam order that petitioners' motion for an award of attorney's fees is denied; and that petitioners' motion to award costs as a penalty is denied; Wright, Mikva and Edwards, CJ's

04-03-81 Notification from Clerk, SC that petition for writ of certiorari was filed in SC No. 80-1640 on 3/30/81

04-06-81 Certified copy of notice from Clerk, Supreme Court that a petition for writ of certiorari was filed in SC No. 80-1640 on March 30, 1981 and is now pending

04-09-81 Per Curiam order that the motions to stay the issuance of the mandate (filed by intervenors Metropolitan Edison Co., et al. and respondent) are granted and the Clerk is directed not to issue the mandate herein prior to May 5, 1981; CJ Wright, Mikva and Edwards, CJ's

04-09-81 Notice from Clerk, Supreme Court that a petition for writ of certiorari was filed in SC No. 80-1656 on April 2, 1981

4-29-81 ORDERED, by the Court, that the opinion filed on 11/19/80 is hereby amended as follows: (see order for details).

4-29-81 ORDERED, by the Court, that the Statement on Denial of Rehearing En Banc filed 3/4/81 is amended as follows: (see order for details).

06-03-81 Certified copy of order from Clerk, Supreme Court granting petition for writ of certiorari in SC No. 80-1640 on 05/26/81

06-03-81 Certified copy of order from Clerk, Supreme Court granting petition for writ of certiorari in SC No. 80-1656 on 05/26/81

TITLE 10—ATOMIC ENERGY

Chapter I—Atomic Energy Commission

PART 50—LICENSING OF PRODUCTION AND UTILIZATION FACILITIES

Technical Specifications

Statement of considerations. The following amendments are designed to clarify the extent to which licensees may make changes, and conduct tests and experiments, which are not specifically provided for in their facility licenses. The amendments reflect consideration of comments received following publication of an earlier draft of these amendments in the FEDERAL REGISTER on April 8, 1961. The amendments substantially revise § 50.36 *Designation of technical specifications,* add a new § 50.59 *Authorization of changes, tests and experiments*; and add on Appendix A, "Contents of Technical Specifications". The revisions for §§ 50.36 and 50.59 are based upon the provisions incorporated in License No. DPR-1 pursuant to the Commission's Memorandum and Order dated November 2, 1960 (in the matter of General Electric Vallecitos Boiling Water Reactor, Docket No. 50-18).

Basically the amendments provide that:

(1) Certain significant design and operating limitations and procedures will be designated as technical specifications which must be adhered to in the absence of specific authorization from the Commission. The technical specifications will reflect in such form limits in design and procedures approved by the Commission. They will represent in essence those parameters which define the boundaries of licensed activity which the Commission has evaluated and approved from a safety standpoint.

(2) The licensee may make changes in the facility, make changes in the procedures described in the hazards summary report, and conduct tests or experiments, unless the proposed change, test or experiment involves a change

in the technical specifications or "an unreviewed safety question", as defined. Records of changes, tests and experiments which do not involve a change in the technical specifications or "an unreviewed safety question" must be kept and included in those made available for inspection by authorized representatives of the Commission and summarized in reports to be periodically submitted to the Commission.

(3) If a proposed change, test or experiment involves a change in the technical specifications or an unreviewed safety question, it may not be carried out unless authorized by the Commission. The request for such authorization must include an appropriate hazards analysis.

(4) Except as noted in paragraph (5), the Commission may authorize any proposed change, test or experiment upon finding that there is reasonable assurance that the health and safety of the public will not be endangered.

(5) With respect to power and testing reactors, the Commission may authorize a proposed change, test or experiment and a change in technical specifications upon determining that it does not present significant hazards considerations not previously described or implicit in the hazards summary report and upon finding that there is reasonable assurance that the public health and safety would not be endangered. If the proposed change involves significant hazards considerations not previously described or implicit in the hazards summary report, the proposed change, test or experiment must be referred to the Advisory Committee on Reactor Safeguards for report and must be scheduled for public hearing.

In conjunction with the adoption of these proposed amendments, the Commission plans to delegate appropriate authority to the staff to determine whether proposed changes, tests and experiments involve a significant hazards considerations [sic] not described or implicit in the hazards summary report and to issue authorization for changes which the rules does not require be referred to the ACRS and to public hearing.

All reports, requests, determinations and authorizations will be made part of the public record of the licensing proceedings.

In order to provide guidance to licensees and applicants, the proposed amendments would add an Appendix A to Part 50 containing a list of matters which are typical of those the Commission would generally expect to be covered by technical specifications in operating licenses. It is emphasized, however, that considerable variation from the subjects listed in Appendix A may be warranted in any particular case. The wide variations found in facility design and operation prevent any listing from being complete. Conversely, it is anticipated that some of the items listed would not be covered in specific operating licenses because of the nature of the particular design or proposed operation.

The proposed amendments would apply to all reactor operating licenses. With respect to existing licenses which do not designate particular portions of the hazards summary report as "technical specifications", the entire report would be designated as "technical specifications". The proposed rules permit amendment of the license upon application by the licensee, or on the Commission's own motion, to designate as "technical specifications" appropriate portions of the hazards summary report.

Notice is hereby given that pursuant to the Administrative Procedures Act and the Atomic Energy Act of 1954, as amended, the following amendments are published as a document subject to codification, to be effective 30 days after publication in the FEDERAL REGISTER.

1. Section 50.36 is amended to read as follows:

§ 50.36 Designations of technical specifications.

(a) Each applicant for a license authorizing operation of a production or utilization facility shall, and each applicant for a construction permit may, designate those provisions of his hazards summary report which he pro-

poses be incorporated as technical specifications in the license or construction permit.

(b) Each license authorizing operation of a production or utilization facility of a type described in § 50.21 or § 50.22 will include technical specifications. The technical specifications incorporated in a license will be designed to include those significant design features, operating procedures and operating limitations which are considered important in providing reasonable assurance that the facility will be constructed and operated without undue hazard to public health and safety. Appendix A is provided as a guide to the type of matters which the Commission would generally expect to be covered by the technical specifications. The Commission may include technical specifications on such additional matters as the Commission finds appropriate to provide reasonable assurance that the facility will be constructed and operated without undue hazard to public health and safety; and may omit items listed in Appendix A if such omission is consistent with the protection of the health and safety of the public.

(c) This section shall not be deemed to modify the technical specifications included in any license issued prior to the effective date of this section. A license issued prior to the effective date of this section in which technical specifications have not been designated, shall be deemed to include the entire hazards summary report as technical specifications. At the initiative of the Commission or the licensee, any license may be amended to include technical specifications of the scope and content which would be required if a new license were being issued.

2. Add the following new § 50.59:

§ 50.59 Authorization of changes, tests and experiments.

(a) The holder of a license authorizing construction or operation of a production or utilization facility may (1) make changes in the facility as described in the

hazards summary report, (2) make changes in the procedures as described in the hazards summary report, and (3) conduct tests or experiments not described in the hazards summary report, unless the proposed change, test or experiment involves a change in the technical specifications incorporated in the license or an unreviewed safety question, as defined in paragraph (c) of this section. If the proposed change, test or experiment involves a change in the technical specifications or an unreviewed safety question, it shall not be carried out unless authorized by the Commission pursuant to the procedures set forth in this section.

(b) The licensee shall maintain records of changes in the facility and of changes in procedures made without prior Commission approval pursuant to this section, to the extent that such changes constitute changes in the facility as described in the hazards summary report or constitute changes in procedures as described in the hazards summary report. The licensee shall also maintain records of tests and experiments carried out without prior Commission approval pursuant to this section. The licensee shall furnish annually to the Commission, or at such shorter intervals as may be specified in the license, a report containing a brief description of such changes, tests and experiments.

(c) A proposed change, test or experiment shall be deemed to involve an unreviewed safety question if (1) the probability of occurrence of an accident previously analyzed in the hazards summary report may be increased; or (2) if consequences of an accident previously analyzed in the hazards summary report may be increased; or (3) if a possibility for a nuclear accident of a different type than any analyzed in the hazards summary report may be created.

(d) The licensee shall file a request for authorization of a change in technical specifications or of any change, test or experiment which requires authorization by the Commission pursuant to paragraph (a) of this section.

The request shall include an appropriate hazards analysis. Each such request shall be filed with the Atomic Energy Commission, Attention: Director, Division of Licensing and Regulation. The licensee shall file three signed originals and 19 additional copies.

(e) With respect to request for changes, tests or experiments or for changes in technical specifications for a facility of a type described in § 50.21(b) or § 50.22, or a testing facility:

(1) If the Commission determines that the proposed change, test or experiment presents significant hazards considerations not described or implicit in the hazards summary report it will refer the request to the Advisory Committee on Reactor Safeguards and will order a public hearing in accordance with applicable procedures. The Commission will promptly notify the licensee of any referral to the Advisory Committee on Reactor Safeguards.

(2) If the Commission determines that the proposed change, test or experiment does not present significant hazards considerations not described or implicit in the hazards summary report, it may authorize such change, test or experiment, without referral to the Advisory Committee on Reactor Safeguards for a report and without a prior public hearing, upon finding that there is reasonable assurance that the health and safety of the public will not be endangered.

(f) With respect to requests for changes, tests or experiments or for changes in technical specifications for a production or utilization facility which is not of a type described in § 50.21(b) or § 50.22 or a testing facility, the Commission may authorize the proposed change, test, or experiment upon finding that there is reasonable assurance that the health and safety of the public will not be endangered.

(g) Any report or request for authorization submitted by a licensee, and any determination by the Commission, or authorization issued by the Commission, pursuant to

this section, will be made a part of the public record of the licensing proceeding. An authorization issued by the Commission will include appropriate changes in the technical specifications.

3. Add the following Appendix A:

APPENDIX A—GUIDE TO CONTENTS OF TECHNICAL SPECIFICATIONS FOR NUCLEAR REACTORS

1. This Appendix is a guide to matters which are typical of those the Commission would generally expect to be covered by technical specifications in operating licenses for nuclear reactors. The generalized form of the guide results in inclusion of items not common to all reactors, and should be used in preparation of technical specifications for a particular facility only to the extent the matters listed are applicable. Conversely, technical specifications are expected to include items other than those listed if such matters could have an effect on the safety of operations comparable in significance to the effect of the following items:

A. *Site.* 1. Physical location of the reactor plant.

2. Minimum distance to boundary of the exclusion area.

3. Principal activities carried on within the exclusion area.

B. *Containment.* 1. Design pressure and maximum total leakage rate at design pressure of the containment vessel (including penetrations).

2. Overall dimensions, materials of construction and approximate free volume of containment barrier.

3. Principal types of containment vessel penetrations, and for each type, the approximate number and methods of closure and sealing (including piping, duct work, and access openings).

4. Shell maximum design pressure under minimum temperature conditions and methods of protection against the cold.

5. Frequency, pressure, and methods of testing of the containment vessel and penetrations.

C. *Primary coolant system.* 1. General system specifications, and major primary system components including:

(a) Number of loops.
(b) Number of isolation and check valves per loop.
(c) Number of steam generators per loop.
(d) Method of coolant circulation and heat removal.
(e) Number of pumps per loop.
(f) Reactor coolant piping material and size.
(g) Volume of primary coolant.

2. Principal reactor vessel design features including:

(a) Temperature and pressure rating (design and operating).
(b) Materials of construction (base metal and cladding).
(c) Overall dimensions.
(d) Types and locations of nozzle connections with respect to core.
(e) Number of and types of penetrations.
(f) Type of closure and any limiting features.

3. Primary coolant specifications:

(a) Materials.
(b) Method of pressurization.
(c) Coolant chemistry limits.
(d) Impurity limits.

4. Operating variables, including:

(a) Minimum core inlet pressure.
(b) Maximum and minimum flow rate through the core.
(c) Maximum core exit bulk temperature.
(d) Maximum heat up and cool down rates of major components.

(e) Reactor vessel pressure limitations as a function of temperature and integrated neutron flux.

5. Principal design features of major components, including:

(a) Primary heat exchanger type and rating.

(b) Type of pump and pump drive.

(c) Isolation valve type and modes of operation.

(d) Check valve type and pressure design.

6. Materials and general configuration of primary system shielding.

D. *Primary plant auxiliary systems.* 1. Principal design features of major components including:

(a) Relief valve types, minimum capacity, relief settings, points for pressure discharge.

(b) Demineralizer type and product specifications.

(c) Pressurizer type and surge capacity.

(d) Coolant charging pump, number, charging rate and pressure design.

(e) Core water injection and containment spray system pumps, number, capacity, injection rate and design pressure.

(f) Reactor plant component cooling system pumps and heat exchanger, number, capacity and pressure design.

(g) Reactor plant control air design pressure, compressor type and rating.

2. Operating limitations, including:

(a) Water chemistry.

(b) Minimum reserve capacity of core water injection and containment spray systems.

(c) Maximum and minimum ambient operating temperature of reactor room.

(d) Minimum level of primary shield tank water level.

E. *Secondary coolant system.* 1. General system design specifications, including:

(a) Coolant.

(b) Maximum pressure, operating and design.

(c) Maximum temperature, operating and design.

(d) Coolant flow rate—maximum and minimum.

(e) Minimum makeup coolant temperature.

(f) Maximum differential temperature and pressure between primary and secondary systems.

(g) Coolant chemistry limits.

2. Principal operating limitations established from considerations of nuclear safety, including:

(a) Loading.

(b) Turbine control.

(c) Steam dumping or bypassing.

(d) Power network interconnections.

(e) Maximum radioactivity.

F. *Reactor core.* 1. Principal core design features, including:

(a) Moderator material.

(b) Reflector material and thickness.

(c) Fuel material, enrichment, and melting or boiling point.

(d) Minimum number of fuel thermocouples, where provided as a safeguard.

(e) Clad material and method of bonding.

(f) Minimum number of clad thermocouples where provided as a safeguard.

(g) Brief fuel element description including nominal dimensions, overall and internal element supports and orificing.

(h) Maximum total mass of core and of fuel in the core.

(i) Maximum number of fuel elements in the core.

(j) Maximum fuel burnup (MWD).

(k) Maximum or minimum void coefficient of reactivity, and maximum operating void fraction.

(l) Temperature and pressure reactivity coefficients, ambient to operating.

(m) Form of burnable poison and method of attachment.

(n) Maximum and minimum reactivity worth of burnable poison.

(o) Brief description of source including minimum initial strength and type.

(p) Number of passes and flow direction through the core.

2. Principal design core temperatures and thermal characteristics, including:

(a) Maximum thermal power.

(b) Maximum local core heat flux (maximum with respect to all variables at rated power).

(c) Minimum burnout safety factor (on heat flux) and correlation method used.

(d) Maximum fuel surface and central temperatures at designated points.

G. *Control and safety systems.* 1. Reactivity control system design and operating limits, including:

(a) Number installed and minimum number of operative control elements and drives.

(b) Principal design features including control element materials, control rod guides, minimum operating clearances, use of followers, limits on allowable operating temperatures and pressures and rod coupling method.

(c) Maximum reactivity worth of automatic control systems and of entire control systems for both operating temperatures (hot) and cold plant conditions.

(d) Maximum reactivity worth of any individual control system component or gang, for hot and cold conditions.

(e) Minimum shutdown control margin for hot and cold conditions.

(f) Minimum number of least reactive control elements corresponding to minimum shutdown margin.

(g) Maximum reactivity addition rate by control elements.

(h) Maximum excess reactivity above cold clean critical.

(i) Automatic modes of reactivity insertion and shutdown and maximum total scram delay time and safety element insertion time.

(j) Type, minimum reactivity worth, conditions of use, and principal design features of auxiliary poison systems.

(k) Rod position indication method and minimum accuracy limits.

(l) Minimum worth of safety control elements cocked during startup, fuel loading and other core manipulations.

(m) Minimum reactor power for automatic control.

2. Nuclear instrumentation system design and operating limits including:

(a) Brief description of the system including ranges, types, and sensitivities of instrument channels and detectors, their degree of independence of operation, and use of redundancy or coincidence circuitry.

(b) Minimum number and ranges of operative level safety and period safety channels during startup and power operation.

(c) Setting of scram points.

(d) Automatic control system inputs.

3. Characteristics of safety control systems auxiliary to the reactivity control and nuclear instrumentation systems including:

(a) Emergency power supply availability, and total loading with respect to minimum capacity.

(b) Devices which are activated on automatic building closure.

(c) Type, functions, and conditions of use of interlocks.

(d) Items which may be bypassed, method of bypassing, and conditions under which bypassing will be used.

(e) Conditions which would automatically cause reactor scram or building closure and activation points for these actions.

(f) Devices causing scram or partial insertion of rods and scram point settings.

(g) Instrumentation primarily or solely provided for analysis of conditions following an accident.

H. *Monitoring systems.* General design features and specific operating limits, including:

1. Stack activity discharge rate averaged over a year and minimum number and sensitivity of operating monitors.

2. Maximum instantaneous stack activity discharge rate.

3. Fuel element failure detection equipment sensitivity, localization and sampling interval (if not continuous).

4. Minimum number and sensitivity of monitors for radiation level detection in accessible areas.

5. Minimum number and sensitivity of monitors of liquid radioactive effluents including primary coolant leak detectors.

6. Criticality monitors in fuel storage areas.

I. *Waste disposal systems.* Design and operating features including:

1. Principal features of equipment for removal of gases or other materials from primary and secondary coolant, moderator, reflector, or shield; equipment capacity and mode of use (continuous or intermittent).

2. Stack height.

3. Minimum waste holdup capacities, storage and processing methods and maximum radioactivity inventories during normal operations, maintenance and refueling.

J. *Ventilation systems.* 1. Brief description of principal features of systems providing safeguards functions, including:

(a) Fans used, capacities and approximate numbers.

(b) Direction of atmospheric pressure gradient across walls, doorways, and other important barriers of the facility and minimum atmospheric pressure differentials across principal barriers where pertinent to contamination control.

(c) Minimum ventilation rates where applicable.

(d) Provisions for ventilation system closure.

(e) Provisions for relief of positive or negative pressures within the enclosed areas upon ventilating system closure.

(f) Location of ventilation system inlets and outlets.

(g) Location, type, and procedures for maintenance of filtering or other air cleaning systems.

K. *Emergency cooling and decay heat removal systems.* 1. Principal system design features.

2. Minimum capacity of emergency heat exchangers.

3. Type, minimum coolant supply, flow rate, and power requirement of emergency cooling systems.

4. Total cooling time made available by emergency cooling systems.

5. Conditions which would automatically cause emergency actions.

6. Source and availability of emergency power.

L. *Fuel storage.* 1. Brief descriptions of physical means by which fuel elements are to be transported within the facility, and conditions under which they are stored.

2. Amount and arrangement (spacing) of special nuclear material to be stored.

3. Basic method or methods by which nuclear safety against inadvertent criticality is assured (mass, geometry).

4. Procedural limitations on quantities to be removed or inserted in storage area at any one time.

5. Means of providing personnel protections against radiation hazards from spent fuel.

M. *Experimental facilities including.* 1. Brief description of principal design features of experimental facilities.

2. Maximum excess reactivity allowed for experiments.

3. Maximum individual reactivity increase to be allowed for any experiment or experimental facility by flooding, draining, poison removal, fueled experiment addition, or other method.

4. For each loop or other experimental facility:

(a) Types of sensors for process variables, output actions, and redundant or coincidence provisions.

(b) Minimum cooling capacity to each experiment, method of cooling, and emergency cooling provisions.

(c) General geometry, minimum pressure resistance, and maximum leak rate of experiment containment barriers.

(d) Significant controls, signals, or other safety mechanisms by which experiments or experimenters (manually or automatically) may shutdown the reactor.

(e) Types of experiments to be conducted and limits on experimental programs, considering such effects as corrosion, explosion, and instrument shadowing.

5. Argon and other activation product limitations.

N. *Administrative and procedural safeguards.* 1. Brief coverage of the following:

(a) The availability of detailed written procedures for operations that might affect nuclear safety and for emergencies.

(b) The manner whereby operating procedures are reviewed and approved for use.

2. Brief description of the following controls procedures and tests:

(a) Administrative organization and controls to the extent that these have potential effect on safety.

(b) General operating principles having a potential effect on safety, including those for initial startup, routine operation, maintenance, refueling, conduct and oper-

ation of experiments, power escalation from criticality to full design power, and emergencies; minimum staffing requirements for such operations where applicable.

(c) Postcritical schedule of maintenance and recalibrating tests of safety system components, monitors, and other equipment having a potential safeguards function including items such as reactor control instruments, control rod systems, effluent release monitors, personnel protection monitors, portable detectors, building leakage and emergency systems.

(d) Procedures for the review within the licensee's organization of proposed modifications in the facility or in operating procedures, and of the design and conduct of experiments.

(Sec. 103, 68 Stat. 936, sec. 104, 68 Stat. 937, sec. 161, 68 Stat. 948, sec. 182, 68 Stat. 953, sec. 183, 68 Stat. 954; 42 U.S.C. 2133, 2134, 2201, 2232, 2233)

Dated at Germantown, Md., this 31st day of May 1962.

For the Atomic Energy Commission

WOODFORD B. MCCOOL,
Secretary.

[F.R. Doc. 62-5615; Filed, June 8, 1962; 8:45 a.m.]

STATEMENT OF POLICY AND NOTICE OF INTENT TO PREPARE A PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

AGENCY: U.S. Nuclear Regulatory Commission

ACTION: Statement of Policy

SUMMARY: The Nuclear Regulatory Commission has decided to prepare a programmatic environmental impact statement on the decontamination and disposal of radioactive wastes resulting from the March 28, 1979 accident at Three Mile Island Unit 2. For some time the Commission's staff has been moving in this direction. In the Commission's judgment an overall study of the decontamination and disposal process will assist the Commission in carrying out its regulatory responsibilities under the Atomic Energy Act to protect the public health and safety as decontamination progresses. It will also be in keeping with the purposes of the National Environmental Policy Act to engage the public in the Commission's decision-making process, and to focus on environmental issues and alternatives before commitments to specific clean-up choices are made. Additionally, in light of the extraordinary nature of this action and the expressed interest of the President's Council on Environmental Quality in the TMI-2 clean-up, the Commission intends to co-ordinate its actions with CEQ. In particular, before determining the scope of the programmatic environmental impact statement the Commission will consult with CEQ.

The Commission recognizes that there are small areas of uncertainty regarding the clean-up operation. For example, the precise condition of the reactor core is not known at this time and cannot be known until the containment has been entered and the reactor vessel has been opened. For this reason, it is unrealistic to expect that the programmatic impact statement will serve as a blueprint, detailing each and every step to be taken over the com-

ing months and years with their likely impacts. That the planned programmatic statement inevitably will have gaps and will not be a complete guide for all future actions does not invalidate its usefulness as a planning tool. As more information becomes available it will be incorporated into the decision-making process, and where appropriate supplements to the programmatic environmental impact statement will be issued. As the decontamination of TMI-2 progresses the Commission will make any new information available to the public and to the extent necessary will also prepare separate environmental statements or assessments for individual portions of the overall clean-up effort.

The development of a programmatic impact statement will not preclude prompt Commission action when needed. The Commission does recognize, however, that as with its Epicor-II approval action, any action taken in the absence of an overall impact statement will lead to arguments that there has been an inadequate environmental analysis, even where the Commission's action itself is supported by an environmental assessment. As in settling upon the scope of the programmatic impact statement, CEQ can lend assistance here. For example should the Commission before completing its programmatic statement decide that it is in the best interest of the public health and safety to decontaminate the high level waste water now in the containment building, or to purge that building of its radioactive gases, the Commission will consider CEQ's advice as to the Commission's NEPA responsibilities. Moreover, as stated in the Commission's May 25 statement, any action of this kind will not be taken until it has undergone an environmental review, and furthermore with opportunity for public comment provided.

However, consistent with our May 25 Statement, we recognize that there may be emergency situations, not now foreseen, which should they occur would require

rapid action. To the extent practicable the Commission will consult with CEQ in these situations as well.

With the help of the public's comments on our proposals we intend to assure, pursuant to NEPA and the Atomic Energy Act, that the clean-up of TMI-2 is done consistently with the public health and safety, and with awareness of the choices ahead. We are directing our staff to include in the programmatic environmental impact statement on the decontamination and disposal of TMI-2 wastes an overall description of the planned activities and a schedule for their completion along with a discussion of alternatives considered and the rationale for choices made. We are also directing our staff to keep us advised of their progress in these matters.

Dated at Washington, D.C. this 21st day of November, 1979.

For the Commission

/s/ Samuel J. Chilk
SAMUEL J. CHILK
Secretary of the Commission

[Docket No. 50-320]

Metropolitan Edison Co., et al. (Three Mile Island Nuclear Station, Unit 2) ; Order

I

Metropolitan Edison Company, Jersey Central Power and Light Company and Pennsylvania Electric Company (collectively, the licensee) are the holders of Facility Operating License No. DPR-73, which had authorized operation of the Three Mile Island Nuclear Station, Unit 2 (TMI-2) at power levels up to 2772 megawatts thermal. By Order for Modification of License dated July 20, 1979, the licensee's authority to operate the facility was suspended and the licensee's authority was limited to maintenance of the facility in the present shutdown cooling mode (44 FR 45271). The facility, which is located in Londonderry Township, Dauphin County, Pennsylvania, is a pressurized water reactor used for the commercial generation of electricity.

II

On March 28, 1979, an accident at the Three Mile Island Nuclear Station Unit 2 resulted in substantial damage to the reactor core and to certain reactor systems and components. The facility is not capable of normal operation and is in a shutdown condition with fuel in the core. Although many systems were damaged or have subsequently failed, the facility is being maintained in a safe and stable cooling condition. The July 20, 1979 Order directed that the licensee maintain the facility in a shutdown condition in accordance with approved operating and contingency procedures with decay heat being removed by natural convection circulation of primary coolant through the core with heat rejection through the "A" steam generator.

Some of the systems and components currently being used to maintain the facility in its present mode of op-

eration were not originally included in the facility's Technical Specifications. In fact, in the present post-accident status of the facility, the license itself does not include explicit provisions or Technical Specifications for assuring the continued maintenance of the plant in a safe, stable condition or for coping with foreseeable off-normal conditions. Moreover, certain portions of the facility's operating license relate to or govern power operation of the facility, the authority for which was suspended by the Order of July 20, 1979. These provisions are now simply inapplicable to the facility in its present post-accident condition. Consequently, the facility's operating license [1] should be modified so as to:

(1) Define operating parameters for the current safe, stable, long-term cooling mode for the facility (defined as the recovery mode), and delete all other permissible operating modes so as to assure that operation of the facility in other than the stable shutdown condition of the recovery mode is precluded:

(2) Impose functional, operability, redundancy and surveillance requirements as well as safety limits and limiting conditions with regard to those structures, systems, equipment and components necessary to maintain the facility in the current safe, stable shutdown condition and to cope with foreseeable off-normal conditions.

(3) Prohibit venting or purging or other treatment of the reactor building atmosphere, the discharge of water decontaminated by the EPICOR-II system, and the

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[1] The existing Appendix B Technical Specifications imposed for the protection of the environment upon issuance of the TMI-2 operating license would be unchanged and would remain in effect, except that Appendix B Technical Specifications 5.1, 5.2 and 5.3, which identify the licensee's pre-accident management organization for activities addressed by the Appendix B Technical Specifications, are deleted since those requirements will now be performed in accordance with proposed Technical Specifications 6.1, 6.2 and 6.5 which will set forth the current requirements for the licensee's management organization for *all* licensed activities.

treatment and disposal of high-level radioactively contaminated water in the reactor building, until each of these activities has been approved by the NRC, consistent with the Commission's Statement of Policy and Notice of Intent to Prepare a Programmatic Environmental Impact Statement (44 FR 67738).

III

For the above reasons, the Facility Operating License has been reviewed and a new set of Technical Specifications has been developed to account for the present condition of the facility and to assure the continued maintenance of the current safe, stable, long-term cooling condition of the facility. The Staff's safety assessment addressing the requirements of the proposed Technical Specifications is set forth in the concurrently-issued Safety Evaluation.

The Office of Nuclear Reactor Regulation has also performed an environmental evaluation of the requirements that would be imposed by these proposed Technical Specifications as reflected in the Environmental Assessment, also issued concurrently. It was determined that since the limits on effluent releases and discharges contained in Appendix B to the Facility Operating License are not being changed and remain in effect, and the proposed Technical Specifications attached to this Order do not authorize a change in effluent types or total amounts nor an increase in power level that the proposed Technical Specifications will not result in any significant environmental impact. Accordingly, a negative declaration is being issued concurrently pursuant to 10 CFR 51.5(c)(1) of the Commission's regulations.

Proposed Technical Specification 6.8.1, regarding Administrative Controls, requires that written procedures implementing certain requirements of the modified Technical Specifications be prepared by the licensee. Proposed Technical Specification 6.8.2 provides that these written procedures are to be submitted to, and are sub-

ject to approval by the NRC prior to implementation. Since these written procedures will implement certain requirements of the proposed Technical Specifications, some period of time will be required after its effective date for the licensee to prepare the appropriate written procedures. Based on discussions with the licensee and an evaluation of the scope of the written procedures required, it has been determined that a period of 30 days from the date of this Order will be sufficient for the licensee's preparation of the written procedures required by proposed Technical Specification 6.8.1.

Incorporation into the license of the proposed Technical Specifications would both impose necessary requirements on the licensee to reflect the present condition of the facility and to assure continued maintenance of the current safe, stable, long-term cooling condition of the facility, and facilitate the Commission's enforcement program by providing a single and readily available compilation of enforceable requirements. For these reasons, it is proposed that the license be amended so as to include the Technical Specifications set forth in Attachment 1 hereto. The formal license amendment incorporating these proposed Technical Specifications will become effective on the expiration of the period specified below, during which the licensee or any other person whose interest may be affected may request a hearing or, in the event a hearing is requested and granted, on the date specified in an order made following the hearing or other disposition of such proceeding.

As indicated above, the July 20, 1979 Order directed the licensee to maintain the facility in a shutdown condition in accordance with approved operating and contingency procedures. This Order is still in effect. The operating and contingency procedures referred to have evolved over the course of the past several months and are now reflected in the requirements that have been included in the proposed Technical Specifications set forth in Attachment 1.

In order to eliminate any possible uncertainty as to the nature and requirements of the operating and contingency procedures referred to in the July 20, 1979 Order, the public health, safety and interest require that that Order be amended effective immediately, as set forth below, pursuant to section 161.b of the Atomic Energy Act of 1954, as amended, to include the requirements in Attachment 1. When the proposed Technical Specifications become effective as a result of the formal amendment of the Facility Operating License, they will supersede the July 20, 1979 Order, as amended, since there will be no need to maintain a duplicate set of legal requirements on the licensee.

IV

Accordingly, pursuant to the Atomic Energy Act of 1954, as amended, it is ordered that (1) Effective immediately, the Director's Order for Modification of License of July 20, 1979 is amended by deleting paragraph (2) and substituting the following:

(2) Pending further amendment of the Facility Operating License, the licensee shall maintain the facility in accordance with the requirements set forth in Attachment 1 to the Director's Order dated February 11, 1980.

(2) Effective March 21, 1980 or, in the event a hearing is requested and granted, on the date specified in an order made following the hearing or other disposition of the proceeding, all Appendix A Technical Specifications and Appendix B Technical Specifications 5.1, 5.2 and 5.3 to Facility Operating License No. DPR-73 in effect on March 28, 1979 and all changes thereto issued between that date and the date of this Order are superseded by the proposed Technical Specifications set forth in Attachment 1 hereto.

(3) The written procedures required by proposed Technical Specification 6.8.1 in Attachment 1 hereto shall be completed and submitted to the NRC 30 days after the date of this Order. Pending approval of the written

procedures by the NRC, the licensee shall follow the previously approved procedures.

V

The licensee or any person whose interest may be affected may, on or before March 21, 1980, file a request for a hearing with respect to this Order, pursuant to 10 CFR § 2.714. As indicated, a request for a hearing with regard to paragraph (2) of this Order shall operate to stay the effectiveness of that paragraph. Accordingly, any such hearing regarding paragraph (2) shall be conducted prior to the adoption of the formal license amendment incorporating the Technical Specifications set forth in Attachment 1 hereto. However, a request for hearing with regard to paragraphs (1) and/or (3) shall not operate to stay the effect of those paragraphs. In the event a hearing is held with regard to paragraph (1) and/or (3), however, such a hearing shall be consolidated with any hearing that may be requested pursuant to paragraph (2). In the event a hearing is held, the issues shall be: (1) whether the requirements set forth in Attachment 1 hereto (summarized in Part II above) are necessary and sufficient for the maintenance of the facility to protect health and safety or to minimize danger to life and property; and (2) whether the provisions of this Order would significantly affect the quality of the human environment.

A request for a hearing must be filed with the Office of the Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Service Section, by the above date. A copy of the request for a hearing should also be sent to the Executive Legal Director, U.S. Nuclear Regulatory Commission, Washington, DC 20555 and to George F. Trowbridge, Esq., Shaw, Pittman, Potts, and Trowbridge, 1800 M Street, NW., Washington, DC 20036, attorney for the licensee. Any questions regarding the contents of this Order should be directed to the Chief Hearing Counsel, Office of the

Executive Legal Director, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

For further details respect [sic] to this action, see (1) Operating License DPR-73, as amended, (2) NUREG-0557, "Evaluation of Long-Term Post-Accident Core Cooling of Three Mile Island, Unit 2." NRC Staff Report, dated May, 1979, (3) Memorandum to R. Vollmer from A. Ignatonis, "TMI-2 Plant Modifications for Cold Shutdown, Rev. 2," dated June 8, 1979, (4) letter to R. Vollmer, NRC, from R. C. Arnold, Metropolitan Edison Co., "Reactor Containment Building Atmosphere Cleanup," dated November 13, 1979, (5) the Commission Staff's related Safety Evaluation and Environmental Assessment (NUREG-0647), and (6) the Director's Order for Modification of License dated July 20, 1979. All of the above documents are available for inspection at the Commission's Public Document Room, 1717 H Street, NW., Washington, DC and at the Commission's Local Public Document Room at the State Library of Pennsylvania, Government Publications Section, Education Building, Commonwealth and Walnut Streets, Harrisburg, Pennsylvania 17126.

Dated at Bethesda, Maryland this 11th day of February, 1980.

For the Nuclear Regulatory Commission.

HAROLD R. DENTON.
Director, Office of Nuclear Reactor Regulation.

[Docket No. 50-320]

Negative Declaration Regarding Proposed Technical Specifications for Three Mile Island Nuclear Station, Unit No. 2

The U.S. Nuclear Regulatory Commission has determined that the public health, safety and interest require Modification of Facility Operating License No. DPR-73, issued to Metropolitan Edison Company, *et al.* for operation of the Three Mile Island Nuclear Station Unit 2 located in Londonderry Township, Dauphin County, Pennsylvania. This action would modify the Technical Specifications of the Facility Operating License to more accurately reflect the present condition of the facility resulting from the March 28, 1979 accident. Some of the systems and components currently being used to maintain the facility in its present mode of operation were not originally included in the facility's Technical Specifications. In fact, in the present post-accident status of the facility, the license itself does not include explicit provisions or Technical Specifications for assuring the continued maintenance of the plant in a safe, stable condition or for providing for foreseeable off-normal conditions. Moreover, certain portions of the facility's operating license relate to or govern power operation of the facility, the authority for which was suspended by Order for Modification of License of the Director, Office of Nuclear Reactor Regulation, dated July 20, 1979. These provisions are simply inapplicable to the facility in its present post-accident condition. Consequently, by Order dated February 11, 1980, the Director (1) amended the Order of July 20, 1979 effective immediately, to require that the licensee maintain the facility in accordance with the requirements set forth in Attachment 1 to the Order, and (2) proposed to formally amend the Technical Specifications accordingly, in the following areas: Nuclear Safety; Core Cooling, Water Inventory and Reactor Coolant System Pressure Control; Instrumentation; Containment Systems; Fire Detection and Fire Suppression;

Electrical Power; Control of Radioactive Materials in Liquid and Gaseous Effluents; and, Review and Audit Functions.

The Office of Nuclear Reactor Regulation prepared a combined Safety Evaluation and Environmental Assessment (NUREG-0647) in connection with this action. It was determined that since the limits on effluent releases and discharges contained in the environmental Technical Specifications for the Facility Operating License (Appendix B) are not being changed and remain in effect, the actions encompassed by this Order do not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. In addition, the Technical Specifications include prohibitions against the purging or other treatment of the reactor building atmosphere, the discharge or other disposal of water decontaminated by the Epicor-II system and the treatment and discharge or other disposal of the high-level radioactively contaminated water now in the reactor building without further Commission approval. Thus, in accordance with this finding, no Environmental Impact Statement will be prepared.

The Safety Evaluation and Environmental Assessment (NUREG-0647) and the Director's Order issued February 11, 1980 are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C., and at the Three Mile Island Unit No. 2 Local Public Document Room in the Government Publications Section, State Library of Pennsylvania, Education Building, Commonwealth and Walnut Streets, Harrisburg, Pennsylvania. Copies may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Richard Vollmer, Director TMI-2 Support, NRR.

Dated at Bethesda, Maryland this 11th day of February, 1980.

For the Nuclear Regulatory Commission.

HAROLD R. DENTON.
Director, Office of Nuclear Reactor Regulation.

THREE MILE ISLAND NUCLEAR STATION UNIT 2

Technical Specifications

Appendix "A"
to
License No. DPR-73

INTRODUCTION

On March 28, 1979, an accident occurred at the facility which resulted in damage to the reactor core and to certain reactor systems and components. The reactor is being maintained in a stable cooling mode removing decay heat by natural convection circulation of primary coolant through the core and the "A" steam generator. The "A" steam generator is producing steam which is condensed in the condenser and recirculated to the "A" steam generator. An alternate means of removing decay heat from the primary coolant is through the "B" steam generator. The steam side of the 'B" steam generator has been modified to provide a water solid, closed loop cooling system which is in turn cooled by the secondary services closed cooling water system. Either steam generator cooling mode is adequate to remove decay heat from the primary coolant.

As a result of the core and equipment damage, various requirements set forth in the Technical Specifications governing operations are no longer appropriate. For example, certain equipment required to be operable is no longer operable as defined in the technical specifications. Other systems not generally relied on for safe shutdown of the reactor are being used to maintain the facility in the stable mode of heat removal. High radioactivity in containment and in the reactor coolant and radioactivity in certain auxiliary areas have limited access to certain

components or have limited the ability of certain systems or components in their original design mode. A number of systems and components have been modified in order to respond to the initial emergency condition.

These revised Technical Specifications are to provide assurance that the facility in its present status will provide adequate safety while certain additional work activities are carried out at the facility during the forthcoming period of core cooling.

In addition to continuing to maintain core cooling, certain work is planned for the period during which these revised specifications will be applicable.

(1) Systems and components presently functioning to maintain core cooling may be modified to enhance their operability and reliability, and new systems may be added to maintain recovery functions.

(2) Presently non-functioning systems or components useful to enhance safety are being restored to operable status or modified to function appropriately.

(3) Activities to maintain control over radioactive effluents from the facility will continue with modifications as necessary to enhance such control.

(4) Decontamination and cleanup of areas to reduce exposure and to control radioactive materials will continue.

These activities and modifications will be performed during the period in which these revised specifications are effective.

The revised Technical Specifications have been prepared to cover the functional capability or performance levels of systems or components required for the safe operation of the facility. The revised Technical Specifications shall

however, in no way modify the obligation of the licensee to take all appropriate steps needed to assure public health and safety in connection with the facility at all times; and shall not be deemed to prohibit or restrict the licensee from taking any emergency action necessary to protect the health and safety of the public in the event of any emergency conditions that may arise during the period governed by these revised Technical Specifications.

Detailed surveillance requirements for implementing these specifications are set forth in the Recovery Operations Plan. The specific plant operating procedures which are subject to review and approval by the NRC staff are identified in Section 6.8 of the Technical Specifications.

These revised Technical Specifications will remain in effect until superseded, and may be supplemented, amended or modified from time to time.

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[page 3.6-1]

LIMITING CONDITIONS FOR OPERATION

3.6 CONTAINMENT SYSTEMS

3.6.1 PRIMARY CONTAINMENT

CONTAINMENT INTEGRITY

3.6.1.1 Primary CONTAINMENT INTEGRITY shall be maintained and all containment penetrations, including at least two OPERABLE containment isolation valves or a double barrier in each penetration, shall be closed when not required open per procedures approved pursuant to Specification 6.8.2. Purging or other treatment of the containment atmosphere shall be prohibited until approved by the NRC.

APPLICABILITY: RECOVERY MODE.

ACTION:

With one containment isolation valve per containment penetration open or inoperable, maintain the affected penetration(s) closed with either:

a. At least one deactivated automatic valve secured in the isolation position, and

b. At least one closed manual valve, or a blind flange.

CONTAINMENT AIR LOCKS

3.6.1.3 Each containment air lock shall be OPERABLE with:

a. Both doors closed except when the air lock is being used for transit entry and exit through the containment, then at least one air lock door shall be closed.

b. An overall air lock leakage rate of less than or equal to 0.05 L_a at P_a, 56.2 psig.

APPLICABILITY: RECOVERY MODE.

ACTION:

With an air lock inoperable, maintain at least one door closed and restore the air lock to OPERABLE status within 24 hours.

* * * * *

BASES

FOR

LIMITING CONDITIONS FOR OPERATION

AND

SURVEILLANCE REQUIREMENTS

NOTE

The summary statements contained in this section provide the bases for the specifications of Sections 3.0 and 4.0 and are not considered a part of these technical specifications as provided in 10 CFR 50.36.

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[page B 3/4-6-1]

3/4.6 CONTAINMENT SYSTEMS

BASES

3/4.6.1 PRIMARY CONTAINMENT

3/4.6.1.1 CONTAINMENT INTEGRITY

Primary CONTAINMENT INTEGRITY must be maintained to ensure that the radioactive materials which were released to the containment atmosphere during the March 28, 1979 incident will not be released to the atmosphere.

On November 21, 1979, the Commission issued a Statement of Policy and Notice of Intent to Prepare a Programmatic Environmental Impact Statement addressing the overall decontamination and cleanup activities at TMI-2, including, among other things, the purging or other treatment of the containment atmosphere (44 F.R. 67738). The Commission recognized in its Statement that it may be in the best interest of the public health and safety to purge the containment during the development of the programmatic statement. If the need to take such prompt action arises the Commission has stated that it will consider the advice of the Council on Environmental Quality (CEQ) as to the Commission's NEPA sponsibilities [sic], and moreover, will not take such action until the activity has undergone an environmental review with opportunity for public comment. The Commission further recognized that there may be emergency situations, not at this time forseen, which could require rapid action. In these situations, the Commission has indicated its intention to consult with CEQ to the extent practicable. Accordingly, the purging or other treatment of the containment atmosphere is prohibited until approved by the NRC consistent with the foregoing.

3/4.6.1.3 CONTAINMENT AIR LOCKS

The containment air locks must be maintained OPERABLE to provide CONTAINMENT INTEGRITY. These air locks will be used during future entries into the containment to ensure that the containment atmosphere will not be released to the environs.

3/4.6.1.4 INTERNAL PRESSURE

The negative pressure limit provides assurance that the containment will not exceed its design negative pressure differential. The positive pressure limit provides assurance that leakage from the containment will be limited for dose considerations.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Commissioners: John F. Ahearne, Chairman
Victor Gilinsky
Richard T. Kennedy
Joseph M. Hendrie
Peter A. Bradford

Docket No. 50-320

IN THE MATTER OF
METROPOLITAN EDISON COMPANY, ET AL.

(Three Mile Island Nuclear Station, Unit 2)

ORDER DENYING MOTION FOR RECONSIDERATION OF CLI-80-25 AND ORDER FOR TEMPORARY MODIFICATION OF LICENSE

On June 12, 1980, the Commission issued a Memorandum and Order, CLI-80-25, which approved purging of the TMI-2 reactor building atmosphere as proposed by the NRC staff. The staff's proposal was described in detail in the "Final Environmental Assessment for Decontamination of the Three Mile Island Unit 2 Reactor Building Atmosphere," NUREG-0662, May 1980. This purging can be carried out in such a manner (a "slow purge") that the release of radioactive effluents, primarily krypton-85, will lie within the limits allowed by the technical specifications which are part of the TMI-2 operating license. A faster rate of purging is advan-

tageous, however, for reasons discussed in the Memorandum and Order. To permit a faster purge the Commission issued an accompanying Order for Temporary Modification of License, which temporarily imposed dose limits in place of the noble gas instantaneous and quarterly activity release limits contained in the TMI-2 technical specifications.[1] Purging of the TMI-2 containment is presently expected to begin on June 28, 1980.

The Commission received on June 23, 1980 a "Joint Motion for Reconsideration of CLI-80-25 and Order for Temporary Modification of License," submitted by Steven C. Sholly, the Newberry Township Three Mile Island Steering Committee, and People Against Nuclear Energy ("PANE"). The Commission has also received a study entitled "Radiation Exposure Due to Venting TMI-2 Reactor Building Atmosphere," prepared by Bernd Franke and Dieter Teufel of the Institute for Energy and Environmental Research, Heidelberg, West Germany, for the Three Mile Island Legal Fund, and dated June 12, 1980. The Franke/Teufel study, which arrived too late to be included in the administrative record for the Memorandum and Order,[2] takes issue with the Commission's conclusion, otherwise widely supported, that the

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[1] For the period of the purge the modified license will control releases of radioactive gases to the atmosphere by limits on the radiological dose which can result from such releases, in particular by requirements that doses to maximally exposed individuals as a result of purging not exceed 15 mrem skin dose, 5 mrem total body dose, or 20% of either of those limits over any one-hour period. These offsite dose limits are in effect equivalent to the objectives set out in 10 CFR Part 50 Appendix I, which implement the Commission's policy that radiation doses from nuclear power plants shall be kept "as low as reasonably achievable" ("ALARA"). The Commission's Order for Temporary Modification of License thus aimed at achieving the same level of health protection intended by the superseded release limits while at the same time permitting a rapid completion of the purging process.

[2] The Commission received a very brief handwritten summary of the conclusions of this study on June 5, 1980 but was not given the full report until June 16, 1980.

physical health impacts of purging the TMI-2 containment as proposed will be negligible. This study is cited in the Joint Motion as evidence of the need for the Commission to reconsider its decision to permit purging. In view of the importance to the public of having accurate information on the health risks of purging, the Commission believes it desirable in the short period remaining before the purging begins to make a prompt though necessarily brief response to the Franke/Teufel study as well as to the motion for reconsideration.

Accordingly, we are attaching to this order a review of the Franke/Teufel study prepared by the NRC technical staff. The staff's review confirms that *all* radionuclides potentially in the containment atmosphere, not just krypton-85, were considered by the staff in its assessment of the environmental impacts of purging the TMI-2 reactor building. Radionuclides other than krypton-85 will not contribute significantly to offsite doses from purging. As the staff's review explains in detail, the Franke/Tuefel study erred by selecting a single erroneously calibrated measurement of the radionuclide concentrations in the containment. This measurement was clearly inconsistent with previously and subsequently measured radionuclide concentrations and gave values too large by factors of ten thousand to ten million. The corresponding dose calculations made by the Franke/Teufel study are thus gross over-estimates. Furthermore, the study's concern about meterological uncertainties and possible inadequacy of monitoring appear to reflect unawareness or misunderstanding of how the purging program is to be carried out. In sum, the Commission has found that the Franke/Teufel study provides no reason to modify the conclusion that the proposed venting of the TMI-2 reactor building involves negligible impacts on physical health.

Turning now to the motion for reconsideration, we find that the discussion above deals adequately with the first reason offered for reconsideration, that "[t]he Orders do not consider in any detail the possible presence of

radionuclides other than Krypton-85 in the TMI-2 containment atmosphere." The environmental assessment, as well as the staff's review of the Franke/Teufel report, confirm that krypton-85 is by far the dominant radionuclide. In any event, it should be noted that the purging will be conducted so that the dose limits established by the Commission's Order for Temporary Modification of License will not be exceeded. A continual monitoring of release activity levels and meterological conditions will be conducted to assure that this requirement is met. Thus if radionuclide concentrations should exceed presently expected values, this fact would become quickly apparent and releases would be controlled or, if necessary, stopped so that doses will remain within the allowable limits.

The Joint Motion criticized what it terms a "radiological assessment" of the health risks of venting as distinct from a "public health assessment" by "public health professionals." The joint petitioners also appended to their motion a letter from Irwin Bross of the Roswell Park Memorial Institute, Buffalo, New York, to the effect that the genetic damage and cancer risk estimates used by the Commission in assessing the risk of krypton venting are out of date and far too low. The short answer to the joint petitioners' concern about the Commission's assessment that purging presents no significant physical health risks is that there was broad agreement with this assessment by groups with expertise oriented toward protection of public health, including the National Council on Radiation Protection and Measurements, the U.S. Department of Health and Human Services, and the Pennsylvania Departments of Health and Public Welfare. The controversial views of Dr. Bross regarding radiation health risks are known to the Commission from previous occasions. To the extent that Dr. Bross would conclude that purging the TMI-2 containment involves a significant physical health risk, his views are clearly at odds with the spectrum of scientific opinion cited here and in the Commission's Memorandum and Order in support of the contrary conclusion.

The Commission thus finds that the Joint Motion presents no reason to alter the Commission's key determination that the proposed purging of the TMI-2 containment will have a negligible impact on physical health. The benefits of prompt purging were discussed at length in the Memorandum and Order. To risk these benefits by selecting an alternative process, which necessarily would involve significant delay and uncertainty, in order to reduce already negligible radiological impacts still further does not strike the Commission as reasonable. Accordingly, the Commission finds the proposed purging entirely consistent with the ALARA principle of keeping radiation exposure "as low as reasonably achievable."

The Joint Motion also urged that the psychological aspects of purging "should be examined more closely" but cited no evidence to contradict the Commission's belief that prompt purging will remove a significant source of psychological stress related to the presence of the disabled TMI-2 facility. The Commission has admitted its lack of expertise in psychology and recognizes that more review and study might further clarify the situation with respect to psychological stress at TMI-2. We remain confident, however, that stress is likely to be minimized by proceeding promptly with a plan that poses no threat to physical health. The Joint Motion offers no reason to believe that further study would change that conclusion. Accordingly, we are not persuaded that purging be delayed for further examination of pychological stress.

Finally, the Joint Motion criticized our finding that the temporary license modification involves "no significant hazards consideration" and therefore may be made immediately effective. We believe the joint petitioners have misunderstood the scope of this finding, which pertains only to the question whether changing the TMI-2 technical specifications from release limits to dose limits involves a significant hazards consideration. The dose limits aim at achieving the same level of protection of public health and safety [3] and, in fact, do so more directly, since it is

[3] See note 1 above.

the associated doses rather than the radioactive releases themselves which are the focus of concern. Accordingly, the Commission reaffirms its determination that the temporary license modification involves no significant hazards consideration and may therefore be made effective immediately.

With regard to purging itself, the unmodified technical specifications which allow for purging were adopted as part of the licensing proceeding for TMI-2 after full opportunity for a public hearing. There has been extensive public participation in the purging decision through public meetings and comments on the environmental assessment. There has thus been ample opportunity for members of the public to raise any issue which might have been brought up in an adjudicatory hearing and to present evidence contradictory to the positions of the NRC staff or Metropolitan Edison. The joint petitioners complain that there has been no public hearing specifically devoted to purging, but they have not indicated that any relevant evidence exists which they have somehow been prevented from bringing to the Commission's attention. Accordingly, since the procedures by which the Commission's orders were developed met the requirements of the Atomic Energy Act and have provided for a thorough consideration of the issues, we reject the suggestion that these orders should be withdrawn on procedural grounds.

For the reasons discussed above, the Commission denies the motion for reconsideration of CLI-80-25 and Order for Temporary Modification of License.

It is so ORDERED.

For the Commission

/s/ Samuel J. Chilk
SAMUEL J. CHILK
Secretary of the Commission

Dated at Washington, DC,
this 26th day of June, 1980.

REPORT BY THE INSTITUTE FOR ENERGY AND ENVIRONMENTAL RESEARCH HEIDELBERG, FEDERAL REPUBLIC OF GERMANY

The NRC staff has made a preliminary review of the findings presented in the report titled "Radiation Exposure Due to Venting TMI-2 Reactor Building Atmosphere" submitted by the Institute for Energy and Environmental Research, dated June 12, 1980. The staff believes that the major conclusions of this report are in error and misleading, primarily because they are based on a highly inflated estimate of the maximum rate at which radionuclides will be released during the venting and an apparent lack of understanding of how the venting will be carried out and controlled.

Heidelberg Finding No. 1

Previous discussion of the venting of radioactive gases from TMI-2 has concerned only the noble gas krypton-85. Besides krypton-85, the atmosphere of the reactor building includes a great number of other radionuclides, some of which would be released into the environment during the blow off of the gases. This could lead to radiation exposures significantly higher than those caused by krypton-85. The most important radionuclides, which have not been sufficiently considered so far include: C 14, Co 60, Sr 89, Sr 90, Ru 106, Cs 134, Cs 137, Pu 239, Pu 241 and others. Even allowing for high filter efficiency, a model calculation for only three of these nuclides showed that population doses would be high enough to cause about three additional cancer cases and an equivalent amount of genetical damage.

Staff Comment

The NRC staff's analysis (NUREG-0662) of the environmental impacts associated with purging the TMI-2

reactor building atmosphere is based on consideration of *all* radionuclides including noble gases, transuranics, tritium, cesiums and cobalts and other particulates. Air samples are periodically collected and analysed [sic] to identify all measureable forms of radioactivity. The dominant and controlling radionuclide is Kr-85. Relative to Kr-85, all other radionuclides in the reactor building atmosphere are insignificant contributors to calculated offsite doses from a postulated purge.

The reactor building particulate samples taken during January through April of this year indicated Cs-137 concentrations ranging from 1.2 X 10^{-8} to 2.7 X 10^{-10} μCi/cc. The particulates Co-58, Co-60, Cs-134, Sr-89, and Sr-90 were measured at levels on the order of 10^{-10} to 10^{-11} μCi/cc or were below minimum detectable levels ($\sim 10^{-10}$ μCi/cc) for the instrumentation. Gross measurements of samples of the reactor building atmosphere taken in April of this year indicate transuranic concentrations no higher than 2.0 X 10^{-10} μCi/cc. It should also be noted that, during the postulated purge, the reactor building atmosphere will be passed through HEPA filters with a measured filtration efficiency of at least 99.97%.

The Heidelberg group based its particulate source term (primarily Co-60 and Cs-137), and the resulting dose calculations and health effects predictions, on the highest reported values for the concentrations of these isotopes, ignoring a number of other values listed on the same table (Table 2.1 of the Met Ed reference). Unfortunately, these single highest values, which were a factor of 10^4 to 10^7 higher than other reported values, were erroneous. Particulate concentrations are determined by measuring the total radioactivity in a sample of air passed through the particulate sampler, and then dividing by the sample volume. In the case of the erroneous values, Met Ed personnel failed to record the sample volume. (Volumes typically were 10^4 to 10^7 cc.) A volume

of 1 cc was arbitrarily assumed by the licensee yielding artificially high concentrations of Cs-137 and Co-60 (1.4×10^{-2} and 7.9^{-4} μCi/cc, respectively). This resulted in calculated dose values which are a million too high for these isotopes.

It is unfortunate that these erroneous values were reported. Nevertheless, the NRC staff believes that the Heidelberg group used poor judgment in using these values and ignoring the many other, lower values available to it. In estimating potential exposures and doses, it is properly conservative to use the highest reasonable source term. However, it is unreasonable to use a single value or set of values when the numerous other reported values, determined both before and after the highest values are consistently so much lower.

Additionally, the Heidelberg group ignored the staff's discussion of the most recent reactor building sample data (i.e., sample data through February 1980) which was available to them in the staffs draft Environmental Assessment for Decontamination of the Three Mile Island Unit 2 Reactor Building Atmosphere, NUREG-0662 (March 1980). This discussion (see Section 5.0, Reactor Building Airborne Activity) indicates that the latest particulate activity levels are on the order of 1×10^{-9} μCi/cc.

Finally, since the Heidelberg dose calculations are based on a fallacious source term, they, too, are fallacious.

Heidelberg Finding No. 2

Uncertainties inherent in the meteorological models and dose calculations mean that it is impossible to exclude that in the proposed purge program individual skin doses due to krypton-85 could exceed the 100 mrem limit.

Staff Comment

The Heidelberg group's assertions regarding the uncertainty of predicting dose from meteorological dispersion

characteristics at TMI are compensated for by the conservatisms incorporated in the actual purge conditions. Purging the reactor building atmosphere at TMI will be carried out using real-time meteorological measurements, containment atmosphere sampling, radiological effluent measurements, and an elaborate environmental monitoring program. Operators will control the release rate, and hence the dose rate, based on actual meteorological conditions and these other measurements. Purging would be stopped at any time that these combinations of measurements and calculations indicate possible dose values that begin to approach limiting values which themselves are well below the imposed release limits.

Thus the Heidelberg group's statement (p. 11 of the 6/12/80 report) that, given releases of Kr-85 during unfavorable meteorological conditions, "skin doses could reach 320 mrem at a distance of 0.5 miles from the stack," is incorrect and appears to have been made without knowledge of how the purging will actually be carried out.

Purging the TMI reactor building atmosphere will be *monitored* and *controlled* to assure that the dose limits specified by the Commission are not even closely approached, thus accommodating the discussed uncertainties.

Heidelberg Finding No. 3

Estimates of health damage should consider not only regional but also global population doses which are an indication of all health effects caused by the release of radioactivity. Both can be estimated only with great uncertainty. The dose effect relation is subject to wide scientific discussion. We cannot exclude that venting Krypton-85 alone could cause at least one additional cancer case (probably skin cancer) plus one case of genetic damage within the next century. However, nothing is known about a potential synergism between krypton-85 beta and ultraviolet radiation.

The results calculated in NUREG-0662 do not exclude the possibility of one cancer case in the world population within the next 100 years as a result of purging. The staff has used the most widely recognized radiation risk estimates to determine the probability of cancer or genetic effects in the 50 mile population surrounding TMI as a result of purging. The average risk of radiation induced fatal cancer to individuals in the 50 mile TMI population was estimated to be 5 chances in 100 billion. Within the world's population, the average risk to individuals, because of further Kr-85 dilution in the earth's atmosphere, would be even smaller than the already negligible risk to people within 50 miles of TMI. The global collective dose of 100 person-rem whole body dose due to Kr-85 (in the Heidelberg estimate) is minute compared to the annual global background radiation dose of 300 million person-rem. It should be noted that several independent organizations, including the National Council on Radiation Protection and Measurements, the Environmental Protection Agency, the Department of Health and Human Services, and the Union of Concerned Scientists, have also concluded that purging would result in negligible public health risks. Because of the conservatism to be used in controlling and limiting doses, even a possible synergism between beta radiation and ultra violet radiation in skin cancer induction would not be expected to change the health effects picture markedly.

Heidelberg Finding No. 4

The environmental monitoring program cannot ensure that all significant radiation doses to the community as a result of decontamination of the atmosphere of the TMI-2 reactor building atmosphere will be detected. Most measurements are not frequent enough and are not made at all in some important localities. Important pathways and radionuclides are neglected.

Staff Comment

The environmental monitoring program for the postulated reactor building purge is one of the most comprehensive programs ever developed for monitoring gaseous effluents from a domestic commercial nuclear power plant. The program incorporates the expertise and resources of the EPA, DOE, NRC, State of Pennsylvania (including trained community monitors), and the licensee. The program includes the availability of 6 mobile (3 EPA and 3 licensee) monitoring units as well as the DOE Atmospheric Release Advisory Capacity (ARAC) which will provide independent predictions of the dispersion patterns of the krypton gas. A detailed description of the monitoring program is contained in Section 8.0 of NUREG-0662 (final report, May 1980) including the number and type of radiation monitoring and sampling devices, their frequency of analysis, and the location of the measurements. An even more detailed report is given in the EPA report, "Long-Term Environmental Radiation Surveillance Plan for Three Mile Island," March 17, 1980. From the comments in the Heidelberg finding and in the body of their report, it is apparent that they had considered neither the EPA report nor the final NUREG-0662. Most, if not all of the Heidelberg group's comments and criticisms are addressed in those two reports.

The radiological environmental monitoring program will be supplemented by direct measurement via the stack monitor of all gaseous radioactive materials discharged during the purge as well as real time meteorological dispersion measurements (taken at least hourly) from the onsite meteorological tower. Additionally, the reactor building atmosphere will be periodically sampled during the conduct of the purge to verify the releases measured directly by the stack monitor. In order to verify that no significant amounts of radionuclides other than Kr-85 are released to the environment during purging, samples from the established network of eighteen operating stations will

continue to be collected. Samples in the downwind sector will be collected every day, rather than the three times per week under normal conditions. In addition at least one sample from "control" stations in each quadrant not in the downwind trajectory will be collected and analyzed on a daily basis.

Heidelberg Finding No. 5

As considerable health damage could be caused by venting the atmosphere of the TMI-2 reactor building, we strongly advise against this procedure. The report of the Union of Concerned Scientists concludes that decontamination is not as urgent as stated by Met Ed and NRC. Therefore, we strongly recommend that the alternative methods for decontamination proposed by UCS and Prof. Morgan be used.

Staff Comment

The NRC staff disagrees that purging the TMI-2 reactor building atmosphere could result in "considerable health damage." NUREG-0662, "Final Environmental Assessment for Decontamination of the Three Mile Island Unit 2 Reactor Building Atmosphere," provides an extensive technical basis for the NRC staff's recommendation to purge the reactor building atmosphere.

EXCERPT FROM GENERAL PUBLIC UTILITIES, INC's, "PLANNING STUDY FOR CONTAINMENT ENTRY AND DECONTAMINATION," JULY 2, 1979

6.0 *CONTAINMENT ATMOSPHERIC FILTRATION AND PURGING*

6.1 *Existing Situation and Design Objectives*

6.1.1 Containment Atmosphere Conditions

The release of large quantities of reactor coolant to the containment coincident with significant fuel failure has led to extremely high airborne levels within the containment. These levels must be reduced as much as possible to minimize operator exposures during containment decontamination activities. Table 6-1 presents a summary of results from numerous containment air samples and the MPC which is allowed in the air in controlled spaces to indicate the magnitude of the problem. The primary contaminants are miscellaneous fission products, noble gases, iodine, cesium, and tritium, all of which must be treated and/or released in a controlled manner to assure the minimum impact on the public health and safety.

It is apparent from analysis of Table 6-1 that the actual value of the specific activity of each of the primary contaminants is not accurately known. A reasonable consistency in the order of magnitude of the primary radioisotopes does exist and this information was considered sufficient for preliminary planning. More accurate and precise knowledge of the containment atmosphere will be essential prior to the start of and during cleanup operations so that an accurate evaluation of the impact of these releases can be made.

Although the bulk of the containment atmosphere radioactivity would be removed prior to containment entry there will still be levels of airborne contamination inside

the containment throughout the decontamination activities. This additional airborne activity is expected from resuspension of radionuclides which had plated out and from the dislodging of radioactivity during remote and manual decontamination activities.

6.1.2 Design Objectives

To evaluate and compare various system designs and operating alternatives for cleanup of the containment atmosphere, it is first necessary to establish objectives. The following objectives are considered appropriate for this aspect of the containment decontamination:

- To minimize the impact on public health and safety from containment atmosphere cleanup
- To assure that operator exposures are ALARA
- To comply with the established release technical specifications
- To minimize the impact of containment atmosphere cleanup operations on the decontamination schedule

HEARINGS ON THREE MILE ISLAND CLEANUP

FRIDAY, NOVEMBER 9, 1979

United States Senate,
Subcommittee on Nuclear
Regulation of the Committee
on Environment and Public
Works, Washington, D.C.

The subcommittee met at 9:37 a.m., in room 4200, Dirksen Senate Office Building, Hon. Gary Hart (chairman of the subcommittee) presiding.

Present: Senators Randolph, Hart and Simpson.

Senator Hart. The hearing will come to order.

Yesterday, this subcommittee ventured into largely uncharted territory. We explored the many unknowns of recovering from a major commercial nuclear accident. The trip into ths [sic] new regulatory terrain was not exactly a reassuring one.

For example, we learned that nearly eight months after the Three Mile Island accident there are still no guidelines, regulations or technical specifications from the Nuclear Regulatory Commission to guide the cleanup and recovery operations at Three Mile Island. We also learned that without such regulatory guidance the ultimate costs and duration of the operation remain very much in doubt. Further, the utility's ability and willingness to bear these costs, and to assure the continuity of this operation also are in doubt. We became familiar with the intricacies and the hazards of each step of the cleanup operation—from the initial step of decontaminating the auxiliary building water to the final crucial step of dismantling and removing the highly radioactive core.

The major lesson of yesterday's hearing, for me at

least, was the understandable nervousness of the nearby neighbors of the Three Mile Island plant. To quote the Chairman of the Board of Supervisors of Newberry Township: "Met Ed's present piecemeal approach," referring to the cleanup process, "is driving Newberry Township residents batty." Chairman Bruce Smith further stated: "A long-range, step-by-step plan could better prepare the community as well as the community leaders with the problems and dangers to be confronted with the cleanup process."

However, testimony yesterday from utility and NRC officials indicated that each side is, at least to some degree, waiting for the other to make the first move. * * *

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[pages 5-7]:

Senator Simpson.

Senator Simpson. Thank you very much, Mr. Chairman.

Yesterday, we heard expressed the sincere concerns of the residents of the local population around Three Mile Island regarding cleanup and recovery operations at the site. As Senator Hart has quoted, we had a most refreshing witness who said that up there, the piecemeal approach was driving them batty, and everyone understood what he was saying when he said that. It was certainly precise.

The testimony, on balance, underscored my belief that a new and more candid planning approach is needed by the utility and especially by the NRC to manage the recovery situation. The utility witnesses stated that a general plan for recovery and cleanup was under development, but that much of the detail would have to be developed as the recovery effort proceeded and as new and possibly changing regulatory requirements were imposed. The NRC witnesses testified that flexibility was needed to develop regulatory requirements as the recovery process moved forward. To be sure, I think some

flexibility on the part of the utility and NRC may be needed to tailor the cleanup program to the situation at the site, particularly as that situation becomes more fully known.

Nevertheless, I feel that a greater sensitivity to the needs of the local community is essential here. We are not dealing, as the Commission normally does, with a new application to built [sic] a facility. Rather, we are faced with a severely damaged plant that is now in stable condition but which poses continuing risks to the local population and to the workers at the site. And we are certainly faced with a community which is already anxious as a result of the accident and highly skeptical of the two organizations directly involved in the cleanup; that is, the NRC and the utility. Given this situation, it seems to me prudent, if not essential for the NRC to lay out in detail for full public review the standards it expects the utility to meet and the means it will use to ensure the compliance.

Mr. Chairman, we will have the Commission with us today, and I would be very interested in hearing reasons why the agency cannot say definitively what it is and is not willing to allow in terms of releases into the atmosphere and river during the cleanup operation, what the impact of those release [sic] is likely to be and what limit should be imposed for the workers and what insurances we should use to ensure the applicable standards are met. I understand that the NRC staff prepared a package of new regulatory requirements somewhat along those lines several months ago and forwarded them to the Commission. I hope that we might know the status of those propose [sic] requirements and what the Commission plans to do concerning them. As I see it, such a set of regulatory requirements properly validated through public review and comment, followed by the preparation of detailed recovery plans to meet those requirements, again subject to public scrutiny, would do much to ease the legitimate local concerns.

Mr. Chairman, the second issue of our hearing today, and one we will review carefully, is how the Commission intends to discharge its responsibilities under the National Environmental Policy Act of 1969. Again, the question seems to be whether the Commission plans a piecemeal approach to recovery or whether a more comprehensive approach to considering environmental impacts is warranted. I think the Council on Environmental Quality will be helpful in that regard.

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[pages 40-44]:

Senator Hart. What is the Commission's position with regard to the desirability or requirement of an environmental impact statement?

Mr. Hendrie. Well, certainly the cleanup of Three Mile Unit 2 [sic] has to be agreed to by the NRC, by Federal authorities. It is clearly a major action in the way that term is used in connection with NEPA, and it needs an impact statement. I have talked this past week to Chairman Speth and CEQ officers—and I see we have Mr. Yost with us this morning—about going through that environmental analysis process in a way which fully satisfies the intent of the legislation but also is consistent with the time scales and need for action in the decontamination program, and we are still at a fairly preliminary stage in terms of mapping out that course of action.

Senator Hart. I guess we are back to where we were yesterday in terms of how much time we have for some of these things, and I would like to get your judgment on public and workers' health and safety implications of various time frames and various delays. Let me just run through a series of them. First of all, your judgment on the risks of delaying the resolution of the radioactive atmosphere presently contained in the reactor building and how soon you think that is going to have to be done to protect the public health.

Mr. Hendrie. I think the sooner that it is done, the better. I don't think there is any pressing danger or urgent risk. That containment has stood the test well, and I have no doubt it will continue to do so. On the other hand, the longer these materials are allowed to remain in gaseous or liquid forms, simply loose in the containment building, the more chance there is that somebody will open the wrong valve or something else will happen and some of it will get out. It is a concern of this kind in connection with the tank in the auxiliary building and the fact that it was just filling up and the prospect was for having to start filling tanks in the other unit that led me to become this concerned back before we started the EPICOR stay to begin to pound on the table and say we have got to move, it is going to the dimension of an emergency situation.

Now the materials within the containment, the krypton in the atmosphere and material there in the water, I think I certainly wouldn't classify it as an emergency situation. As I say, I think that containment will keep them in there in good shape for a good long time in [sic] necessary. But it just adds some increment, however small it may be, to the public risk to go for extended periods of time without processing. We need to get on with it.

Senator Hart. On the one hand this, but on the other hand that. We heard testimony yesterday from the people in the area who feel that they haven't been dealt with as candidly as possible. I understand on the one hand this, but on the other hand that. But what we have got to know and provide to the people is a sense of when. So I guess what I am asking is a little more specific question.

Mr. Hendrie. A schedule hasn't been developed.

Senator Hart. When will it be developed?

Mr. Hendrie. I expected [sic] Met Ed is due to come in with their layout of where they hope to go and some approximate scale of time they would hope to accomplish

it; I judge from the discussion yesterday that that was pretty close in.

Senator Hart. Well, it was late as hell, frankly, and it is awfully hard to pin anybody down on this. Everybody says they are waiting for somebody else. Frankly, I am on the side of that second panel yesterday. I don't live there, but if I did I would want the Government of the United States and the State of Pennsylvania and the utility to begin to give me a little more specific answers instead of they are going to move and then we are going to move, and on the one hand this, but on the other that. I think what people want is a sense of certainty, and I guess what I want is a sense of when they are going to have a sense of certainty. Are we talking about a month? Three months? Six months? Or a year?

Mr. Hendrie. There ought to be a reasonable layout, I would think, available on a preliminary basis in several months.

Senator Hart. Several months.

Mr. Hendrie. I think that that will not become sort of a semi-firm schedule for a longer time than that simply because it becomes involves [sic] in the analysis requirements under NEPA; it is part of making those decisions. I will point out when the staff publishes its environmental impact statement, which is inevitably going to take some time, that that still dosen't fix the schedule in an absolute, concrete way, because as you take each of these steps, you then learn a further piece of information, and after we have done whatever is necessary to do with the containment atmosphere, the radioactive material in the containment atmosphere, good, now we can start processing the water. But the schedule on the processing of the containment water will be contingent on how the gas processing goes. The entry to the containment will be contingent on the processing of water. Any extended entry to the containment will be contingent on how well the cleanup of the residual materials on the wall of the containment go. And all

of these affect how soon you might get down to the primary system and talk about opening the vessel and getting the core out.

So people are simply going to have to recognize there are certain variablities in these schedules. I think the point your are punching, and I must say with, I regard, good justification, is here we are some seven months or so on down the line after we collected ourselves after the accident and there is not that at least preliminary laying out of how do we get from here to there, "there" being decontamination.

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[pages 54-55]:

[Mr. Hendrie]: So I don't regard it as a particularly perilous situation at all.

You asked how long do we have and what are the risks of human error. I think in view of what has happened and the care which we believe everybody is taking with this machine, the risk of human error is pretty small. I say that in full humility, recognizing this is the precise machine in which human error was exercised to put us in the situation.

Senator Hart. The last part of the situation was how long do we have? Can you keep it a year? Five years? Ten years?

Mr. Hendrie. I think all of those time scales—I would think that times like five to ten years would just be unconscionable. It is not necessary from an engineering and health physics standpoint. To have that just sitting there with a damaged core endlessly would be unspeakable. But in terms of some technological driving point which says it is seven years, we are really getting to the point where the remaining cladding is all going to fall down.

Senator Hart. So somewhere between one and five years is the level of unconscionability and unspeakability.

Mr. Hendrie. Well, it seems to me getting anywhere near in less than a year is practically out of the ques-

tion, and if we haven't got it out of there in five years, why that really will be pretty poor performance.

Senator Hart. So one to five years.

Mr. Hendrie. Yes.

Senator Hart. Do we know what we are going to do with it when we get it out?

Mr. Hendrie. The core debris, the radioactive core debris will be placed in heavy shielded casks, and then we will look around and say, good, now what do we do with the casks? It is good to get it in the shielded casks, that is the right thing to do, it is a lot less likely to be harmful there than elsewhere. But that still isn't the full answer. Then there are about two options in the time frame we are talking about. One of the them is to keep the casks on site for some period that I can't estimate for you, and the other one would be for one of the major government processing centers to accept those casks, where they would remain, again for a time I can't estimate for you, until we finally get on to solving the high-level waste problem in this country.

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EXCERPTS FROM U.S. NUCLEAR REGULATORY COMMISSION'S RESPONSE TO LETTER FROM SENATORS HART AND SIMPSON, JANUARY 2, 1980

[pages 2-3]:

QUESTION 3:

Normally the regulations for an operating reactor allow release of certain quantities of radiation to the river and the atmosphere. Do you plan to adhere to these regulations for the cleanup?
If not, what alternative do you propose and why?

ANSWER:

The technical specifications for releases of radioactive materials from operating reactors are based on guidelines Appendix I to 10 CFR Part 50. Appendix I to 10 CFR Part 50 provides numerical guides for design objective and limiting conditions for operation to meet the criterion of "As Low as is Reasonably Achievable" and which also meets the standard set in EPA's regulation 40 CFR 190 concerning radiation dose to the public from the uranium fuel cycle. We will require that during cleanup and recovery operations the releases of radioactive material to the environment are maintained within the limits specified in Appendix I to 10 CFR Part 50. However, the Commission may determine that if the public interest requires, additional measures be taken for the protection of the public health and safety such as a requirement for one of the cleanup options mentioned above. The efficacy of such additional measures will be an integral part of the Environmental Assessment.

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EXCERPT FROM GENERAL PUBLIC UTILITIES, INC.'S RESPONSE TO QUESTIONS FROM THE U.S. NUCLEAR REGULATORY COMMISSION, JANUARY 4, 1980, PAGE 6

Disposal of Krypton-85 in the Containment Building is a prerequisite for Reactor Building decontamination. Delays in RB decontamination represent potential safety hazards that cannot be quantified without a better understanding of the actual core configuration. The additional safety hazard arises from the increased potential for reactor core deterioration the longer the core remains in an unexamined state. The longer it takes to gain access to the Reactor Building and determine the true state of the primary coolant system, reactor pressure vessel, core intervals and reactor fuel, the longer the uncertainty remains as to what the ultimate risk is for further releases of radioactive nuclides from the facility. Even without this quantified risk, however, it is believed that purging the Reactor Building of Krypton-85 represents the most prudent path to disposal of the Krypton-85 radioactive noble gas. The potential for delays represented by the other options represent additional risks of core deterioration that regardless of the magnitude, justify purging the reactor building atmosphere as soon as possible. The true answer to this question cannot be determined, in fact, until the Krypton-85 is disposed of and access is gained to the reactor building. Only then can the true safety hazard and radiation dose to the work force be assessed. It is not prudent to believe that the reactor core will remain in a safe condition indefinitely.

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EXCERPTS FROM REPORT OF THE U.S. NUCLEAR REGULATORY COMMISSION'S SPECIAL TASK FORCE, "EVALUATION OF CLEANUP ACTIVITIES AT THREE MILE ISLAND," FEBRUARY 28, 1980

[page IV-5]:

C. *What are the current criteria for conducting cleanup activities?*

The current criteria are contained in the Commission's Order of February 11, 1980. This Order establishes new Technical Specifications governing operation of the facility in what is called a "Recovery Mode." The specifications for release of radioactive material from the site and for occupational exposures are consistent with (and no more stringent than) existing Commission regulations, guidelines and criteria applicable to a normal operating facility. However, the Order "prohibits venting or purging or other treatment of the reactor building atmosphere, the discharge of water decontaminated by the EPICOR-II system, and the treatment and disposal of high-level radioactively contaminated water in the reactor building, until each of these activities has been approved by the NRC." These prohibitions effectively preclude the planned release of any radioactive liquid or gaseous material from TMI-2 without prior Commission approval. Low-level solid waste (rags, clothing, etc.) generated during cleanup operations in the auxiliary building are permitted to be transported off site.

Notwithstanding the February 11, 1980 Order, there continues to be a lack of well-defined criteria to govern the day-to-day activities that involve handling, and planned or unplanned releases, of the materials covered by the prohibitions. Such criteria, which could be based on existing Technical Specification limits with an upper bound on allowable total quantities to be released, are essential to the continued conduct of the cleanup operation. The task force found no evidence that the Staff or the licensee

was preparing such interim criteria for Commission consideration. Without them, the cleanup operation is being unnecessarily prolonged, and minor unplanned releases that would be inconsequential in a normal operating plant are elevated to an unwarranted significance. An example of the former is the perceived need to obtain Commission approval to open the outer personnel air lock door which would release about 0.05 curies of Krypton-85 (see Appendix 4). An example of the latter is the occurrence on February 11 in which the incidental off-gassing of about 0.3 curies of Krypton-85 from some leaked primary system water caused considerable public concern. To put these releases in perspective, TMI-2 has been releasing between 65 and 80 curies of Kr-85 per month in recent months; a normal operating facility of this type may release over a thousand curies of radioactive gasses per month. In 1978, TMI-1 released an average of 1300 curies of radioactive gasses per month.

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[page IV-9]:

G. *What is the relative priority of cleanup for NRC and the licensee?*

The actions of the NRC and licensee shortly after the March 28 accident had high priority in each organization (e.g., design and installation of the EPICOR II system). However, this initial high priority has eroded as time elapsed.

The licensee's senior vice president, Mr. Robert Arnold, stated to this task force that, due to financial difficulties, cleanup of TMI-2 is fourth priority. GPU has placed ahead of TMI-2 cleanup in their list of priorities: maintenance of a safe condition at TMI-2; preparations for restart of TMI-1; and refueling and restart of the Oyster Creek plant. Mr. Arnold further stated that if the priority of TMI-2 cleanup were raised above that of TMI-1 and Oyster Creek refueling and restart, an accelerated

TMI-2 cleanup schedule could be pursued. He pointed out that GPU/Met. Ed are concerned about the Pennsylvania Public Utility Commission's actions on proposed rate increases. Mr. Arnold expressed concern that unfavorable action by the PUC will further exacerbate Met. Ed's financial position, causing further delays in TMI-2 cleanup.

It is the Task Force's opinion that NRC has also placed a low priority on TMI-2 cleanup, relative to review of operating plants, developing and implementing the TMI Action Plan, and taking action on near-term operating licenses. A very limited staff has been assigned to the TMI Support Group both at Headquarters and on site. Temporary assignments of staff continue to be made to the on-site group which has a permanent core group of only 3 to 4 professionals. Although the Commission itself has not specifically placed a lower priority on reaching decisions for TMI-2 cleanup activities, the Commission's lack of ensuring that definitive cleanup criteria are established and the need for Commission approval of all activities which could provide releases has led to the staff's perception that the Commission considers this to be a low priority activity.

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[page IV-22]:

O. *What are CEQ's current views on the NRC's NEPA responsibilities for cleanup actions?*

The Task Force met with members of the CEQ staff to obtain its views on the Commission's responsibilities under NEPA. CEQ staff views NRC's approval of total cleanup operations at TMI as a major federal action which legally obligates the Commission to prepare an Environmental Impact Statement. By total operations, CEQ staff means actions extending from the reactor cleanup through to ultimate disposal of the wastes result-

ing from that cleanup.[1] Until that Statement is prepared, CEQ staff believes that NRC approval of certain actions, such as purging the radioactive gas from the containment. would be a segmentation of the entire clean-up program in a manner inconsistent with NEPA. However, CEQ staff recognizes that NEPA permits the NRC to approve certain actions which could result in limited radioactive effluents prior to completion of the Programmatic Statement. These actions include steps to obtain more information and data relevant to further clean-up activities, and actions necessary to maintain TMI in a safe and stable condition. Maintenance to ensure continued operation of the fan coolers inside the containment was specifically referred to as an example of permitted interim maintenance operations.

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[1] The task force was informed that, under current plans, the PEIS would cover delivery of the waste to a waste disposal site, but would not address the environmental impact of disposal of the waste at that site.

EXCERPT FROM U.S. NUCLEAR REGULATORY COMMISSION'S RESPONSE TO QUESTIONS FROM SENATORS HART AND SIMPSON, PAGES 11-12

QUESTION 3:

Please include regulatory guidelines that will remain stable over the period of the cleanup, consistent with the Commission's responsibilities to protect the public health and safety and the environment.

ANSWER:

The staff anticipates that existing Commission regulations, guidelines and criteria applicable to a normally operating facility, will continue to be applied to cleanup activities at TMI-2. However, we recognize that although certain activities would otherwise be permitted at a normally operating facility, it may be warranted, in the public interest, to prohibit them at TMI-2 even though they could be conducted in full compliance with existing effluent limitations in the operating license or NRC regulations, until further evaluation of them is undertaken. At this time, we have identified several such activities: disposal of water decontaminated by EPICOR-II system, treatment and disposal of high-level contaminated water now in the reactor building, and venting or other treatment of the reactor building atmosphere. An example of how such a further restriction affects the cleanup plan is shown in our analysis of the cryogenic case (see response to Question 1). For the other three cases we assumed that if any proposed method of treatment and disposal meets existing Commission regulations, guidelines, and criteria for operating reactors, the method would be acceptable. For the cryogenic case we assumed that even if venting the reactor building would meet criteria, it would be prohibited and that an alternative method, which would further reduce radioactive effluents (such as cryogenic processing of gases), would be necessary.

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EXCERPT FROM TRANSCRIPT OF PUBLIC HEARING CONDUCTED BY THE U.S. NUCLEAR REGULATORY COMMISSION, MARCH 19, 1980, PAGE 16

MR. COLLINS: Well, let me follow up on that. As a result of many of those conversations that occurred that day, there was a meeting in the White House between DOE and NRC—

(Crowd interrupts.)

MR. COLLINS: —At which time it was resolved that those community monitoring programs and an involvement of you officials would be undertaken. Last week we met with Mayor Reed here in Middletown to discuss that very program with him, and we have plans in a week to initiate a meeting with you people to discuss that.

SPEAKER: Why just Middletown?

MR. COLLINS: I'm talking about all of the local officials in the surrounding areas.

SPEAKER: I was never invited.

MR. COLLINS: No. I said the meeting is being established. I'm not saying that we had that meeting.

(Crowd interrupts.)

MR. COLLINS: Your suggestion did not go by the board. I did not ignore it.

SPEAKER: Maybe we could help Mr. Collins. Let's take a vote. Now, careful.

All for releasing the crypton [sic], applaud.

(No response.)

SPEAKER: Those against releasing the crypton [sic].

(Applause.)

EXCERPT FROM TRANSCRIPT OF PUBLIC HEARING CONDUCTED BY THE U.S. NUCLEAR REGULATORY COMMISSION, MARCH 21, 1980, PAGES 16-18

CHAIRMAN AHEARNE: Go ahead.

MRS. PRELESNIK: If you don't talk too long.

REV. VASTINE: I won't talk to [sic] long, but I want to apologize for talking too long because I haven't had the chance to talk to you ever and I probably will not again.

I am saying, friend, that you know if there is violence, God help us that there won't be, in the Harrisburg area, if there is eruption of the population there, my dear friend, in terms of the rush of emotion to do something, to do something that is untoward, I say, my dear friend, that it is in your hands.

DR. COLMAN: Let me try to pick up here if I can.

CHAIRMAN AHEARNE: I think we both perhaps have some roles in that. Go ahead, Doctor.

DR. COLMAN: I think perhaps Reverend Vastine is picking up on a point that I wanted to try to emphasize here.

The fact that we are here indicates that there is a problem and the fact that we are having to gather our own technical information and present it to you indicates that there is a problem. And the fact that there were so many people as angry as they were in Middle Town on Wednesday and I gather in Elizabeth Town last night indicates that there is a problem. And I think the problem really is one of distrust, absolute distrust for the variety of authorities who have been hoping to be in control in the matter of TMI; that includes Met. Ed., that includes the NRC.

One of the results of that is that we need assurance from independent experts that the new information which we are being fed is, in fact, accurate. And I think increasingly we are capable of drawing our own conclusions once we have the facts in front of us. But I think that what Reverend Vastine was alluding to is, I guess really it is the main point I want to try to make here.

We have felt out of control of our own lives in that area ever since the 28th of March last year. Every time we are told that something is about to happen, although which there is no real assurance of our safety, we again feel out of control. Every time we here [sic] that there is the most minimal leak, as in yesterday's leak, we feel again that we are out of control.

I was at the meeting in Middle Town on Wednesday, just for a short time because I got there late. One of the clearest things that was coming across there was that the people in that area seemed to be sick and tired of listening to or speaking to people from the NRC who are incapable of making decisions there onsite. The clearest message that that group got across, other than its anger, was they want you there. They want you there before any decision is made on venting and want you to make it in full view of the strength of the opinions that are held in that area.

I have been tracking sort of the tone of meetings ever since the one in Middle Town that Mr. Gilinsky was at with Congressman Ertle. It was kind of a watershed meeting. It became clear, I think, at that point of the total emotional reaction of people in the area and Mr. Gilinsky gave some indication of hearing that and that heartened us to a degree.

I am getting scared. As a psychologist I am getting scared. Those meetings are rowdy. Middle Town is a reasonably rough town as they go. I was on my way over to the Liberty Fire Hall the other night to go to those meetings and I was warned by some high school kids, you don't want to go there mister, this is turning into a heavy scene and they were right.

It is monotonic. It just seems going up. And I think unless some mechanism can be developed so the people in that area have a realistic understanding that they are gaining control over the situation there by having a clear effect on the Commission about its decision, that anger level is going to keep on going. Wherever it goes, I don't want to speculate, but it is not healthy, it is not good.

EXCERPT FROM U.S. NUCLEAR REGULATORY COMMISSION STAFF'S "FINAL ENVIRONMENTAL ASSESSMENT FOR DECONTAMINATION OF THE THREE MILE ISLAND UNIT 2 REACTOR BUILDING ATMOSPHERE," NUREG-0662, MAY, 1980, PAGE 1-1

1.0 *Summary and Recommendation*

The NRC staff has prepared this summary of the Final Environmental Assessment for those who prefer to follow the main themes of the assessment without referring to the technical descriptions, calculations, and other data that provide the foundation upon which the staff's recommendation is based.

The krypton-85 (Kr-85) released into the reactor building during the accident on March 29, 1979, [sic] must be removed from the building so that workers can begin the tasks necessary to clean the building, maintain instruments and equipment, and eventually remove the damaged fuel from the reactor core. Those tasks must be performed whether or not the plant ever again produces electricity. Radiation from the krypton gas, although thinly dispersed through the reactor building atmosphere, nevertheless poses a threat to workers who would have to work in the building for prolonged periods.

This Final Environmental Assessment (NUREG-0662) presents a discussion of the information considered by the NRC staff in arriving at its recommendation that the preferred method for removing the krypton-85 from the reactor building is by a kind of flushing process by which the gases would be pushed out of the building and fresh air pulled in.

The Metropolitan Edison Company (the licensee) on November 13, 1979, asked the NRC staff for permission to purge or remove the reactor building atmosphere containing the krypton-85 to the outside (Ref. 1). In March 1979, the NRC staff published the draft version of this

Environmental Assessment (NUREG-0662) and two subsequent Addenda for public comment (Ref. 2). The staff has received approximately 800 comments on the draft Environmental Assessment. Of these, approximately 195 responses generally supported the purging of the reactor building, approximately 500 opposed it, and the remaining responses were either recommended alternatives for removing the krypton or comments that took no position on the staff's recommendation. Substantive comments received by the NRC staff will be printed in Volume 2 of this Assessment.

From this process have emerged some NRC staff conclusions on four basic aspects of dealing with the reactor building atmosphere:

—The potential physical health impact on the public of using *any* of the proposed strategies for getting rid of the krypton-85 is negligible.

—The potential psychological impact is likely to grow the longer it takes to reach a decision, get started, and complete the process.

—The purging method is the quickest and the safest for the workers on Three Mile Island to accomplish.

—Overall, no significant environmental impact would result from use of any of the alternatives discussed in this Assessment.

* * * * *

[SEAL]

UNITED STATES
NUCLEAR REGULATORY COMMISSION
Washington, D.C. 20555

May 1, 1980

Docket No. 50-320

Memorandum for: Wm. H. Regan, Jr., Chief
Siting Analysis Branch, DE

From: Donald P. Cleary, Section Leader
Regional Impact Analysis Section
Siting Analysis Branch, DE

Subject: TMI-2 ATMOSPHERIC DECONTAMINATION

On April 21, 1980, I received a telephone call from Dr. Bruce P. Dohrenwend, Head, Social Psychiatry Research Unit, Columbia University, responding to your letter of April 9, 1980, which transmitted NUREG-0662 "Environmental Assessment for Decontamination of the Three Mile Island Unit 2 Reactor Building Atmosphere", and which requested comments he might have regarding psychological stress associated with atmospheric decontamination alternatives. Dr. Dohrenwend's comments are primarily directed toward local citizens needs to be informed and to participate in the decisions on atmospheric decontamination. He emphasized the relationship between information and participation and the level of psychological stress within the population.

Dr. Dohrenwend found NUREG-0662 and Addendums 1 and 2 inadequate public information documents in several respects. There is insufficient information provided on the relative risks and consequences of the decontamination alternatives. The reader is left with the impression that engineering considerations, rather than possible human consequences, are to determine the selection of an alternative. The central problem of maintaining an ability

to monitor and control the reactor core needs to be more fully explained in terms of the potential risks to the population if this ability is not maintained. He emphasized the urgency of clearly informing the local population of the risks to the general public of not decontaminating the atmosphere quickly or not decontaminating the atmosphere at all. Risks and potential consequences need to be presented within a probabilistic framework which can be comprehended by the average resident of the area.

Dr. Dohrenwend stated that NRC should intensify its efforts to inform the public and to allow the public to play a more active role in deliberating the relative merits of the atmospheric decontamination alternatives. We should especially communicate with and involve those who are representative of the whole community, local elected official, individuals from the media and from representative community groups. In terms of representation, greater weight should be given to residents closer to TMI, especially within five miles as this group appears to be under the greatest stress. To achieve the most meaningful communication and involvement he suggested establishing a mechanism whereby a local consensus can be developed on the most acceptable atmospheric decontamination alternative. Such an effort should be undertaken quickly and should be assisted with the following:

—a summary of the findings of the various studies, of stress, altitudes [sic] and perceptions of the local population toward TMI;

—a thorough and clear explanation of the threats associated with each of the alternatives; and

—heavy reliance on outside experts, who are accepted as neutral, to explain and interpret technical and scientific information required to understand relative risks and consequences.

Dr. Dohrenwend emphasized his confidence that if citizens are given adequate facts and responsibility in the decision process they will act rationally.

/s/ Donald P. Cleary
DONALD P. CLEARY
Section Leader
Regional Impact Analysis Section
Siting Analysis Branch
Division of Engineering

cc: B. Dohrenwend

EXCERPT FROM TRANSCRIPT OF PUBLIC HEARING CONDUCTED BY U.S. NUCLEAR REGULATORY COMMISSION, JUNE 5, 1980, PAGE 58

COMMISSIONER BRADFORD: By "unwarrantedly long" you are saying—

DR. BAUM: I would think anything over three or four or five months would probably be getting to the point of being too long.

You have to also remember that as long as the plant remains unstable, and the uncertainty continues, that characterizes it now, the possibility for accidental leakage remains. Those kinds of things are stressers.

COMMISSIONER BRADFORD: That is the real point, I take it. You are not talking so much about anxiety related, solely related to Krypton, as anxiety related to the plant?

DR. BAUM: That is a primary source, yes.

CHAIRMAN AHEARNE: Any other questions of this gentleman?

COMMISSIONER KENNEDY: Did the—the other consultant who is here, did he want to add anything?

VOICE: That basically summarizes it.

CHAIRMAN AHEARNE: Fine. All right. Bernie?

DR. SNYDER: I would like to go on to the last slide. We'll try to move along a little faster.

(Slide.)

CHAIRMAN AHERANE (sic): It is a very important subject. There is no rush.

EXCERPT FROM TRANSCRIPT OF MEETING OF ADVISORY COMMITTEE ON REACTOR SAFETY, PAGES 5-7

Therefore, in order to get the venting over as soon as possible, I believe, it appropriate to allow the waiving of the current tech spec values. Draft orders are before us. I hope we can make decisions today on both of those issues.

Mr. Bickwit, would you care to summarize the two orders you have prepared for us?

MR. BICKWIT: The first order would grant permission for the venting in accordance with the conditions prescribed by the staff in its recommendation. The situation that you face from a legal matter is that the licensee may vent only if it receives approval from the NRC.

The first order would grant that approval, subject to the conditions imposed by the staff. It poses three questions which will have to be decided by the Commission. These are listed toward the bottom of page 2 of the order.

It states that the Commission must decide whether there is "sufficient need for prompt decontamination of the containment atmosphere to justify going ahead prior to completion of the programmatic impact statement."

It must also "decide whether the decontamination method recommended by the staff can be carried out consistent with the Commission's statutory mandate to ensure adequate protection of public health and safety"; and three, "whether the environmental review has met the requirements of the National Environmental Policy Act."

The order goes on to deal with each of those questions and comes to the conclusion that each of them can be resolved in a way which will permit the action which the staff recommends.

The second order is a modification, a temporary modification of the license which would relieve the licensee

from certain tech spec requirements. Because it is an amendment to the license, an opportunity for a full adjudicatory hearing is offered to those who could be adversely affected by the order.

The finding is made, however, that there are no significant hazards, [sic] considerations involved in the issuance of this order. Therefore, the required hearing, if held, would be held after the fact of the permitted actions.

CHAIRMAN AHEARNE: And incorporated into the already scheduled hearing?

MR. BICKWIT: That is right. We presently have a proceeding in which there have been requests for hearings with respect to changing the original tech specs for this license. That hearing has not been granted at this point. This order provides that if that hearing is granted, and if a hearing is granted under this order, that the two would be consolidated.

CHAIRMAN AHEARNE: All right.

COMMISSIONER GILINSKY: Could you summarize the modifications in the second order?

MR. BICKWIT: Yes. The present tech specs, as I understand it, would not permit the venting either by a fast purge or by a slow purge. The current tech specs stand in the way of both of those actions. The fast purge is, as I understand it, inhibited by the releases that can be taken—that can be made in a sudden fashion, whereas the slow purge is inhibited by the quarterly release limits.

CHAIRMAN AHEARNE: You mean that doing it in a given quarter—completing it in a given quarter?

MR. BICKWIT: That's right. So that these particular tech specs do not stand in the way of either such action. I think I ought to ask Bernie Snyder, who has recommended the precise limits that are incorporated in this order to elaborate on that—what those limits are.

DR. SNYDER: On page 3 of the second order, the limits appear, which would be substituted for the instantaneous and quarterly average tech spec limits, which are 2.1.2 in the reference there.

Basically, they will be Appendix I limits, which are (a) and (b) there. Fifteen millirem skin dose, and five millirem total body dose.

CHAIRMAN AHEARNE: Appendix I limits also meet the EPA guidelines?

DR. SNYDER: Yes. Item (c) was added because Appendix I does not have a rate limitation. We felt it would be advisable in order to assure meeting, especially, (a), the skin dose; that there would be a 20 percent or three millirem per hour limit.

Measurement of Strontium-90 Released in Venting of the TMI Unit 2 Containment Atmosphere: June 28 - July 11, 1980

Joan Harvey, Ph.D.
Richard G. Piccione, Ph.D.
Daniel M. Pisello, Ph.D.

This study was conducted under the auspices of Accord Research and Educational Associates, Inc.

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Between June 28 and July 11, 1980, Metropolitan Edison (Met Ed) vented the containment building of their Three Mile Island (TMI) Unit 2 nuclear reactor. Prior to the venting Met Ed reported [1] that the building atmosphere contained approximately 57,000 curies of krypton-85, a few curies of tritium, and far smaller amounts of other isotopes present as suspended particulates, e.g., radioactive cesium and strontium. The utility claimed that the amount of suspended particulate radioactivity was very small and that the exhaust stack filtration system was good enough to keep emission of radioactive particulates below detectable limits. The NRC decided to waive the "required" environmental impact statement for the venting. The NRC further compromised public health by temporarily suspending the federal regulations that limit the concentration of airborne isotopes that may result offsite from plant releases. Finally, the releases were made without the NRC requiring immediate check

[1] Letter from W. E. Riethle, TMI Environmental Control Manager, dated October 8, 1980. Data excerpted from Met Ed in house report.

on the amount of beta activity that was being released in the form of suspended particulates, specifically leaving them blind to strontium-90, one of the most abundant and lethal isotopes in the reactor.

Accord Research and Education Associates (AREA) set up 24-hour monitoring in the field during this entire two-week period, to measure radiation levels and collect air particulate samples in the vicinity of TMI. AREA detected the released krypton as far away as two miles from the plant and often observed ground level concentrations of krypton-85 substantially greater than the maximum permissible concentration (MPC) of 300,000 picocuries per cubic meter. In addition, AREA sampling of air particulates yielded a positive result for strontium-90, indicating that the release of this hazardous isotope was at least one million times greater than what the utility had estimated as possible.

Radiation levels were measured with a thin window Geiger-Mueller "pancake" probe connected to a Victoreen "Thyac III" portable rate meter. The audio output of the rate meter was fed into a digital accumulator-timer. This arrangement detects changes in the count rate of 10 counts per minute (cpm), using a one minute counting period. The background count rate in the Three Mile Island area consistently averaged around 30 cpm. We converted our excess counts above background to krypton concentration using a calibration factor determined from laboratory experiments with a similar detector performed at Pennsylvania State University. These experiments yielded 310 cpm above background per microcurie of krypton-85 per cubic meter.[2] In addition, comparison of measurements made in the field by this Penn State group with measurements made by the AREA group at the same time and location confirmed our use of this calibration factor.

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[2] Jester, W.A., "Evaluation of radiation monitor effectiveness for detection of krypton-85," report from Breazeale Nuclear Reactor, Pennsylvania State University, June 1980.

Air particulate samples were collected on one-inch diameter Millipore membrane filters (pore size 0.45 microns), at a flow rate of 10 liters per minute. After aging for several weeks, each filter was counted for gross beta activity using a low background thin plastic phosphor scintillation detector. Subsequently, all filters were combined and analyzed for gamma emissions using a Ge(Li) detector. Finally the combined filters were subjected to radiochemical analysis for strontium-90 and strontium-89, yielding the positive result discussed below.

Twenty-four hours daily throughout the TMI venting, two-man teams in the field tried to locate the point of maximum ground level activity. This point is found directly downwind from the exhaust stack and somewhat further from the plant than the point at which the spreading cloud or "plume" of effluent gas and aerosol first reaches the ground. Low-lift helium balloons were released frequently both up- and downwind of the stack in order to study the local wind patterns and locate the plume centerline. Air particulate samples were collected in the plume at the point of maximum ground level activity, and that activity was recorded continuously. While one two-man team tended the air sampling pump and recorded radiation levels during sample collection, a second team continued to survey the surrounding area with another radiation detector to verify that the pump had indeed been set up at the point of maximum ground level activity and to detect, as quickly as possible, any shift in the location of this maximum.

Figure 1 shows the measured ground level activity averaged over one hour intervals for the entire monitoring period. Gaps in the graph indicate periods during which no data was recorded, e.g. on July 2 there were no AREA monitors in the field. The NRC-specified maximum permissible concentration for krypton-85 was exceeded for several hours around midnight June 30, July 3 and July 5 and for ten daylight hours on July 8.

Our ground level measurements of krypton-85 concentration provided an estimate of the rate and pattern of releases from the reactor. Using a simple atmospheric dispersion model [3] we calculated a release rate of 100-150 curies per hour for most of the daylight hours of June 30-July 7. This value is consistent with the utility's data for that period, available through the NRC.[4] However, for late night and early morning hours during this period and for the daylight hours of July 8 we calculated release rates 3 to 4 times higher. These higher release rates were acknowledged only for the daytime releases on July 8. No release-rate data has been made available by the utility or the NRC for nighttime venting.

The high rate of nighttime venting is evidenced by the peaks of activity observed around midnight on June 30, July 3 and July 5. The absence of such midnight peaks on other nights is probably due to a high degree of atmospheric stability and low wind speed. On those nights these conditions caused the plume to rise very high resulting in low ground-level activity. Other periods of low activity in Figure 1 may be due to the occurrence of similar atmospheric conditions, interruptions in the venting, or the fact that the monitoring teams were not in the centerline of the plume. For example, it was impossible to reach this line when the wind was blowing down the river.

Figure 1 also shows the time periods during which air particulate samples were taken. The volume of air sampled and the amount of krypton-85 in each sample is shown in Table 1 for each filter. A total of 6.3 microcuries of krypton-85 in a sampling volume of 51 cubic meters passed through the set of 12 filters. No filter disc

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[3] Turner, D.B., "Workbook of atmospheric dispersion estimates," Office of Air Programs, Research Triangle Park, United States Environmental Protection Agency, 1970. AP-26.

[4] NRC purge status reports from Middletown Office, 29 June-9 July, 1980.

showed gross beta activity above the detection limit of 1.2 picocuries. The average gross beta background in the Harrisburg area is 0.02 picocuries per cubic meter, reported as cesium-137.[5] Thus background gross beta activity deposited on each filter is well below the detection limit.

The gamma scan of the combined filters showed no radionuclides above the detection limits shown in Table II. However, radiochemical analysis of the combined filters for strontium-90 yielded 0.95 ± 0.36 picocuries or .018 picocuries per cubic meter of sampled air. This value is 18 to 50 times larger than the local background concentration from global fallout.[6] This result indicates an average strontium-90 to krypton-85 activity ratio in the effluent of 1.6×10^{-7}. According to Met Ed's reported containment atmosphere inventory given in Table III, the maximum ratio of strontium-90 to krypton-85 in the plume, assuming no filtration at all, is 2.1×10^{-10}, approximately 760 times less than our result. Assuming the claimed particulate filtration efficiency of 99.98%, AREA calculates that Met Ed released 3.8 million times as much strontium-90 as they had originally predicted possible.

Measured gross beta activity for individual filter discs is consistent with the result of the strontium analysis and provides an upper limit to the ratio of gross beta activity to krypton-85 activity of 2.0×10^{-6} in the filtered air. This limit is consistent with the gamma analysis in Table II.

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[5] Office of Radiation Programs, Quarterly Report: Environmental Radiation Data, United States Environmental Protection Agency, Eastern Environmental Radiation Laboratory, Montgomery, Alabama, Report 19-20, April, 1980.

[6] Alan Smith, United States Environmental Protection Agency, Las Vegas, Nevada, personal communication, *and* Environmental Measurements Laboratory, Environmental Quarterly, October 1, 1980, EML-381.

On the basis of our field observations we conclude that an individual located on the plume centerline and at the distance of maximum ground level activity throughout the entire venting received a krypton-85 skin dose of approximately 6 millirems. Doses due to inhalation and direct exposure to other components of the plume are apparently negligible. However, the long term health effects of particulate radionuclides released to the surrounding farmlands are much more serious.

Using Met Ed's post-venting estimate of 43,000 curies of krypton-85 released and our measured ratio of strontium-90 to krypton-85 activity, we calculate a total of 7 millicuries of strontium-90 released. A reasonable estimate of cesium-137 released is approximately 20 millicuries. This estimate is consistent with our strontium, gamma emission and gross beta measurements and with the higher volatility of cesium. We further estimate about 1.5 millicuries of strontium-89 was also released. We calculate here only the effect of strontium-90, the most important isotope.

About 40% of the land in the TMI area is cropland including pastureland for milk cows. We assumed therefore that 40% of the released isotopes are deposited on crops or pasture, and of this amount, 1% is ingested by humans each year. Allowing for the radioactive decay, the result is a total of 1.1 millicures of strontium-90 eventually ingested by humans, resulting in a population dose of 2000 person-rems to the whole body from the ingested strontium-90.[7] Using a doubling dose of 10 rems for adults for all forms of cancer derived from the results

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[7] Bunch, D.F., "Dose to various body organs from inhalation or ingestion of soluble radionuclides," in N.V. Steere, ed., Handbook of Laboratory Safety, Second Edition, Chemical Rubber Co., 1971, *and* U.S. NRC Regulatory Guide 1.109, "Calculation of Annual Doses to Man From Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1, October 1977.

of the Tri-State Survey,[8] we find 200 doubling doses delivered to the population. In a population with a fatal cancer rate of 28%,[9] this much radiation will yield 56 additional cancer deaths. Children, infants and the unborn are much more vulnerable to the effects of radiation. Studies by Steward[10] on the carcinogenic effect of x-rays indicate a doubling dose for the unborn of approximately 1 rem. Thus, the additional risk of cancer or other radiation-induced effect is ten times greater in the young and unborn. Therefore, as many as 560 or more additional cancer deaths could result from this release of strontium-90 if the contaminated food was consumed principally by infants and pregnant women.

AREA's results show that a significant amount of strontium-90 was released to the environment from TMI during the June 28-July 11 venting period. Significant releases of strontium-89 and cesium-137 must also be inferred. As AREA wished to know the ratio of strontium-90 to krypton-85 in the TMI releases, and to measure specifically the amount of strontium-90 in those releases, we drew air samples from the plume centerline and at a distance of maximum ground level activity wherever possible. In this way, the background strontium-90 from global fallout was only a small fraction (less than .05 picocuries) of the reactor effluent strontium-90. Therefore, the background strontium-90 did not limit the sensitivity of our measurement, and we were able to measure the strontium-90 activity to krypton-85

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[8] Bross, I.D.J., Ball, M., Falen, S.: "A dosage response curve for the one rad range: adult risks from diagnostic radiation." American Journal of Public Health *69*, 130-136, 1979.

[9] The cancer mortality rate of 28 per cent is calculated from the 625,000 cancer deaths expected in a population of 2.2 million people referred to in NUREG-0683, section 6.1.5.2.

[10] Bithell, J.F., Stewart, A.M.: "Prenatal irradiation and childhood malignancy: a review of British data from the Oxford survey." British Journal of Cancer *31*, 271-287, 1975.

activity ratio in the reactor effluent to be 1.6 parts in 10 million.

The United States Environmental Protection Agency (USEPA), using their fixed air samplers, relied on chance to blow the narrow plume their way. This design also increased the volume of air ratio to the reactor effluent strontium-90, and also resulted in significant and variable amounts of background strontium-90 from fallout.[8] This background deposit substantially reduced the sensitivity of their measurement of the crucial strontium-90 to krypton-85 activity ratio. The significant and remarkable quantity of strontium-90, released to this agricultural region and measured by AREA, was not reported by the USEPA.

In summary, AREA's findings showed toxic radionuclides including significant amounts of strontium-90 were released in the two week venting period (June 28-July 11) of the containment building of the damaged TMI Unit 2 reactor in quantities that are 4 million times greater than the published predictions of Met Ed that were accepted by the NRC at the time. The airborne toxic radionuclides patterned themselves in a pie shaped wedge called a plume, with the highest readings seen downwind of the reactor and at a distance of maximum ground level activity. The long term health effects of strontium-90 released as particulates onto the farmlands were calculated to yield 56 additional fatal cases of cancer to adult humans eventually ingesting food from this area. Future generations ingesting crops from this area, because they will be children, are more vulnerable to the effects of radiation. Thus, AREA calculates 50 to 300 additional fatal cancers and other genetic health effects will appear in the next five to ten generations. No reports of deposits of strontium-90 or other particulate radionuclides have been made by Met Ed or the USEPA to date.

FIGURE 1

Measured Ground Level Activity at TMI
During Venting of Unit 2 Containment
June 28 to July 11, 1980

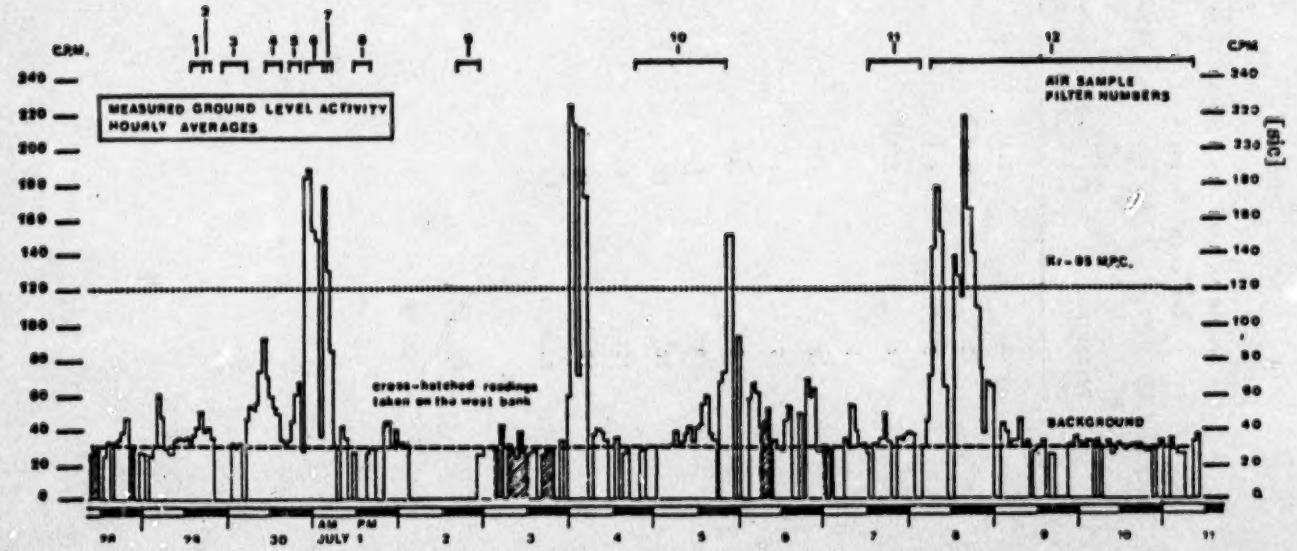


TABLE 3

Sample volumes and krypton-85 activity
for each air particulate sample

Filter No.	Volume Filtered (cubic meters)	Krypton-85 Filtered (nanocuries)
1	2.1	97
2	0.9	16
3	4.3	nd*
4	2.7	180
5	1.9	130
6	3.2	830
7	14	290
8	1.6	nd
9	4.2	710
10	12	1,700
11	5.0	50
12	16	2,900
TOTAL:	51	6,300

*no data

TABLE II

Results from combined filters*

Gamma-ray emission Ge(Li) Spectroscopy**	Total activity (picocuries)
beryllium-7	LT 30
potassium-40	LT 60
manganese-54	LT 2
cobalt-58	LT 2
cobalt-60	LT 3
zirconium-95	LT 3
ruthenium-103	LT 20
iodine-131	LT 6
cesium-134	LT 3
cesium-137	LT 3
barium-140	LT 4
cerium-141	LT 4
cerium-144	LT 20
radium-226	LT 50
thorium-228	LT 5
Radiochemical analysis**	
strontium-89	LT 2
strontium-90	0.95 $\pm$ 0.36

*Total filtered volume of 51 cubic meters containing 6.3 microcuries Krypton-85. LT = less than.

**Measurements performed by Teledyne Isotope, Westwood, New Jersey.

TABLE III

Reactor building air sample results (Met Ed)

Nuclide	Half-Life	Concentration (Curies per cubic meter)
Hydrogen - 3	12.26y	$5\pm1 \times 10^{-5}$
Carbon - 14	5730y	$4\pm1 \times 10^{-7}$
Iron - 55	2.6y	$<6 \times 10^{-11}$
Cobalt - 58	71.3d	$<1 \times 10^{-11}$
Cobalt - 66	5.26y	$<1 \times 10^{-11}$
Kryton - 85	10.76y	$0.93\pm.07$
Strontium - 89	52d	$1.1\pm.5 \times 10^{-10}$
Strontium - 90	28.1y	$2.2\pm.2 \times 10^{-10}$
Ruthenium - 103	39.6d	$<2 \times 10^{-9}$
Ruthenium - 106	367d	$<2 \times 10^{-10}$
Silver - 110m	253d	$<2.5 \times 10^{-11}$
Iodine - 129	1.7×10^{7}y	$6\pm2 \times 10^{-11}$
Cesium - 134	2.05y	$1.7\pm.1 \times 10^{-10}$
Cesium - 137	30.23y	$9.3\pm.3 \times 10^{-10}$
Uranium - 235	7.1×10^{8}y	$<5 \times 10^{-12}$
Uranium - 238	4.51×10^{9}y	$<2 \times 10^{-11}$
Plutonium - 238	86y	$<2 \times 10^{-12}$
Plutonium - 239,240	24,400y & 6580y	$<2 \times 10^{-12}$

All nuclide concentrations listed with a less than symbol indicate that those nulcides are below the listed instrumentation sensitivity for those nuclides.

Note: Sample taken April 1980 through containment penetration R-626. Approximate inventories can be calculated by multiplying the concentration by the free volume of the containment building, 5×10^{4} cubic meters.

SUPREME COURT OF THE UNITED STATES

No. 80-1640

UNITED STATES NUCLEAR REGULATORY COMMISSION, ET AL., PETITIONERS

v.

STEVEN SHOLLY, ET AL.

ORDER ALLOWING CERTIORARI
Filed May 26, 1981

The petition herein for a writ of certiorari to the United States Court of Appeals for the District of Columbia Circuit is granted.

The case is consolidated with 80-1656—*Metropolitan Edison Company, et al.*, Petitioners v. *People Against Nuclear Energy, et al.*, and a total of one hour is allotted for oral argument.

SUPREME COURT OF THE UNITED STATES

No. 80-1656

METROPOLITAN EDISON COMPANY, ET AL., PETITIONERS

v.

PEOPLE AGAINST NUCLEAR ENERGY, ET AL.

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